ORDER NO. HAD8510283C9

Service Manual

COMPACT disc DIGITAL AUDIO

DIGITAL

Portable CD Player

Compact Disc Player

SL-XP7

Color

(K)...Black Type
(S)...Silver Type

Color	Areas
(K) (S)	[E] ...Switzerland and Scandinavia.
(K) (S)	[EK] ...United Kingdom.
(K) (S)	[XL] ...Australia.
(K) (S)	[EG] ...F.R. Germany.
(K) (S)	[EB] ...Belgium.
(K) (S)	[EH] ...Holland.
(K) (S)	[EF] ...France.
(K) (S)	[Ei] ...Italy.
(K) (S)	[XA] ...Southeast Asia, Oceania, Africa, Middle Near East and Central South America.
(K) (S)	[XM]...Central South America.
(K) (S)	[PA] ...East PX.
(K) (S)	[PE] ...European Military.
(K) (S)	[PC] ...European Audio Club.

SPECIFICATIONS

■ Audio

No. of channels: 2 (left and right stereo)
Frequency response: 4 ~ 20,000 Hz +0.5 dB −1.0 dB
Dynamic range: 90 dB
S/N ratio: 90 dB
Harmonic distortion: 0.004% (1 kHz, 0 dB)
Total harmonic distortion: 0.006% (1 kHz, 0 dB)
Channel separation: more than 90 dB (1 kHz)
Wow and flutter: below measurable limit
Output voltage: 2V (at 0 dB)
Output impedance: 440 ohms

■ Signal Format

Sampling frequency: 44.1 kHz
Correction system: Technics Super Deconding Algorithm
D-A conversion: 16-bit linear

■ Pickup

Type: FF-1 (Fine Focus - 1 beam)
Light source: Semiconductor laser
Wavelength: 780 nm

■ Headphones

Output: max. 15 mW (32 ohms)

■ Functions

Features: Auto play,
Track random access,
Programmable play
(15-track memory).
Forward skip,
Backward skip,
Forward search,
Backward search,
Repeat play,
Headphones jack,
High filter switch.

Digital display: No. of tracks,
Total playing time (min., sec.),
Track being played,
Elapsed playing time,
Remaining time,
Programmed order,
Repeat indicator,
Battery indicator.

■ General

Power supply: Dual DC in +6V, −6V
Power consumption:
AC adaptor 5 W
Carrying case (option): 3.6 W
Dimensions (W x H x D): 126 x 31.9 x 126 mm
Weight: 520 g

Technics

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Adjustment Manual

1. DISASSEMBLY PROCEDURE FOR POWER-ON CHECK MODE

Disassembly in the following steps for power-on check, repair and adjustment.

1-1. Special Tools

① FPC junction PCB SZZP1039C
② FPC extension cord SZZP1040C, SZZP1041C
③ PCB connection cord SZZP1042C
④ AC adapter SH-CDA3U

1-2. Standard Tools

① Screwdriver for watch used
② Hexagonal wrench 1.5 mm

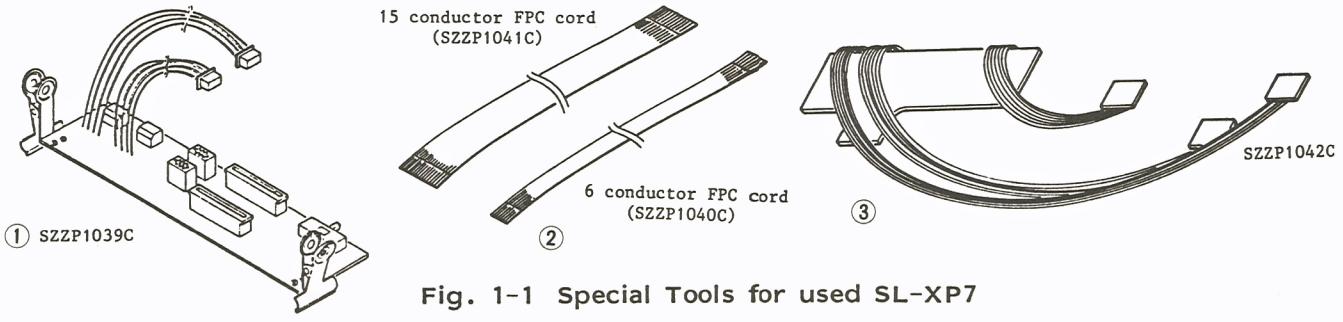


Fig. 1-1 Special Tools for used SL-XP7

1-3. Disassembly Procedure

(Notes for Disassembly)

① Lay soft cloth or the like on the table for preventing parts from being scuffed.
② Drive the optical pick-up outwards if electrically possible. It is convenient for disassembling (especially in replacing the optical pick-up).

(Preparation)
- Place a disc.
- Set the player to the standby mode.
- Drive the pick-up to a desired position (if should be end track) with the skip key.
- Switch off the power supply.

(1) Remove the bottom panel in the following steps

① Unscrew the four screws shown in Fig. 1-2.

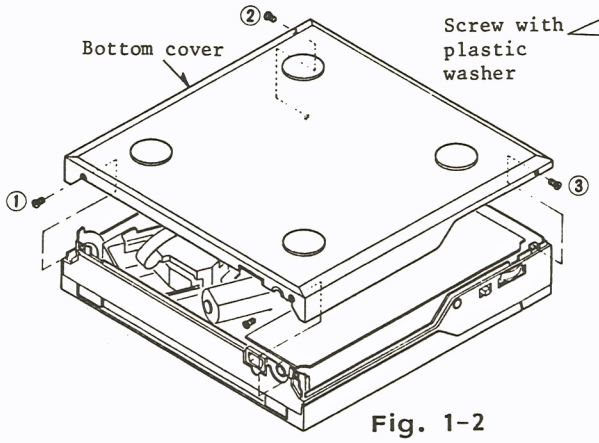


Fig. 1-2

(2) Remove PCB in the following steps

① Unscrew the four screws shown in Fig. 1-3.

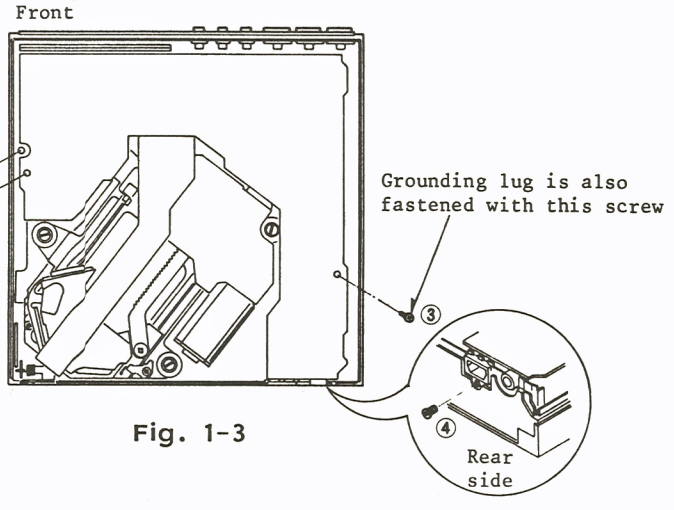


Fig. 1-3

② Disconnect the connectors CN106 and CN107 shown in Fig. 1-4.
③ Disconnect the two FPC cords shown in Fig. 1-4.

ENGLISH

(Note)
Shorted the 15 conductor cord led from the optical pick-up with a clip or the like. (Damaged if opened for about 20 seconds.)

DEUTSCH

(Hinweis)
Das 15-wertige Kabel vom optischen Abnehmer mit einer Klammer o.ä. kurzschließen (sonst trägt es 20 Sekunden nach dem Abnehmen Schaden davon).

FRANÇAIS

(Nota)
Court-circuiter la diode électro-luminescente du câble à 15 conducteurs de la tête de lecture optique avec une pince ou tout autre chose de similaire. (Un endommagement surviendra si l'on met hors circuit pendant environ 20 secondes.)

ESPAÑOL

(Nota)
Poner en cortocircuito el cable conductor desde el captador óptico con una grapa o cosa parecida. (Se puede dañar si se tiene abierto por unos 20 segundos).

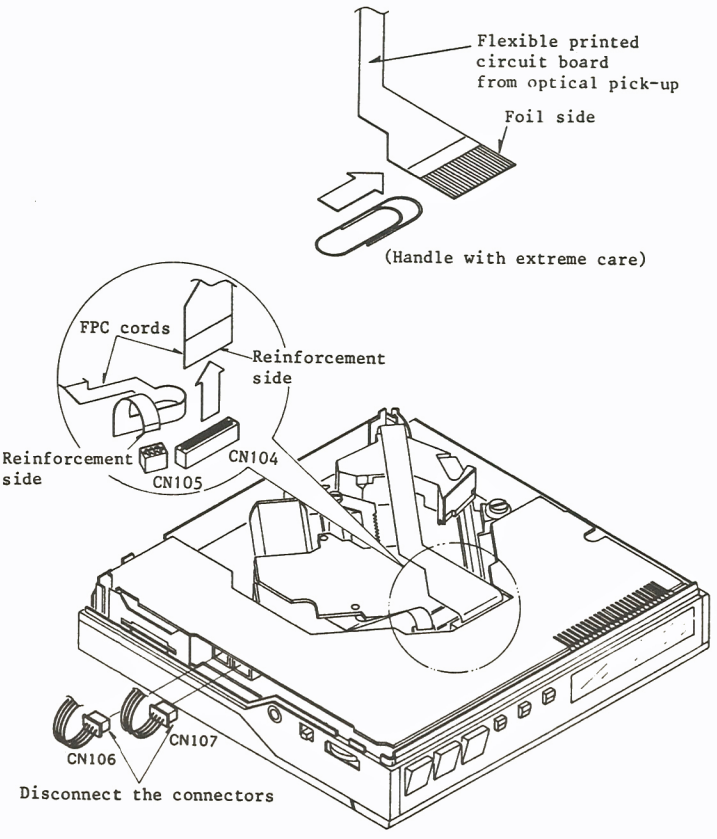


Fig. 1-4

⑤ Remove the digital PCB as shown in Fig. 1-5.

(Note)
Remove PCB by holding it at a point close to the board connector for preventing PCB from being cracked because two PCBs are connected with three board connectors.

⑥ Remove the servo PCB as shown in Fig. 1-6.

(a) Remove the spindle PCB by unscrewing the three fastening screws.

(Note) Exercise care not to loose the three plastic washers of the PCB fastening screws.

(Hinweis) Darauf achten, daß die drei Plastikbeilagscheiben der Schrauben zur Befestigung der Schalttafel nicht verlorengehen.

(Nota) Prendre garde de ne pas desserrer les trois rondelles en plastique des vis de fixation de la plaquette à circuits imprimés.

(Nota) Tener cuidado de no perder las tres arandelas de plástico de los tornillos sujetadores de la TCI.

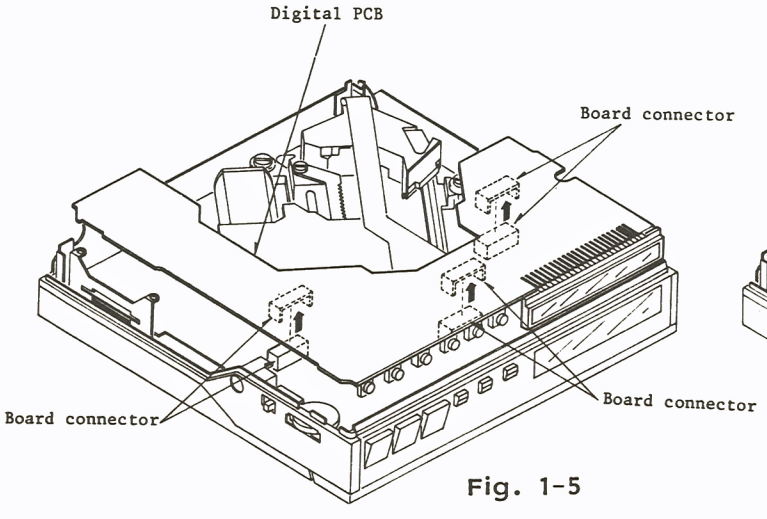


Fig. 1-5

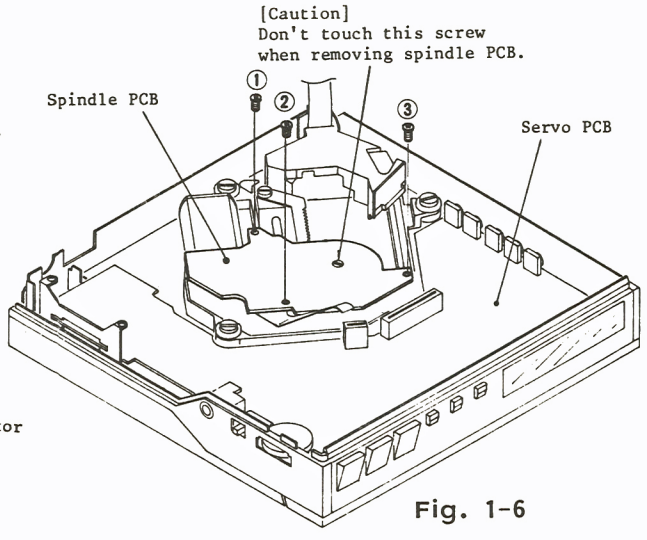


Fig. 1-6

(b) Turn the worm gear as shown in Fig. 1-7 so that the rack gear is driven to a position where it does not contact the servo PCB (i.e., the optical pick-up is in outward position).

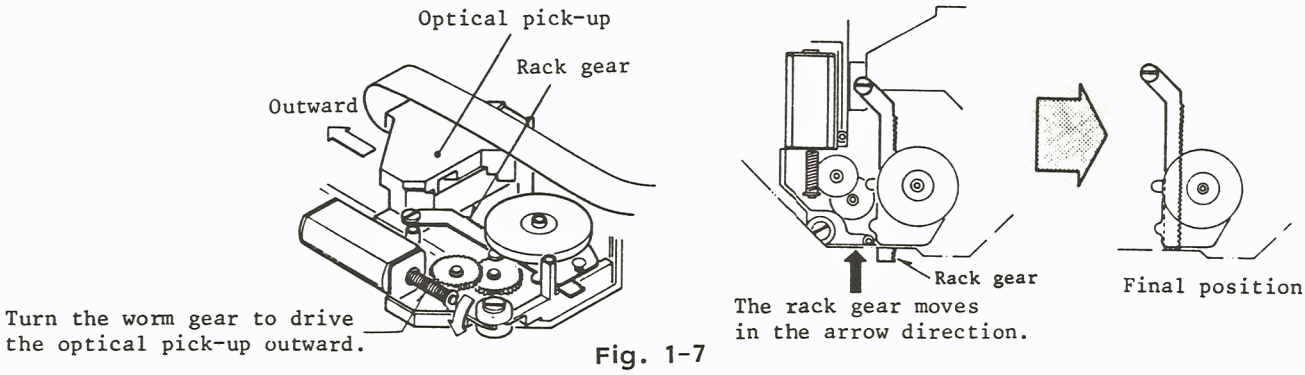


Fig. 1-7

(c) Move the servo PCB in the direction of shown in Fig. 1-8 and remove PCB.

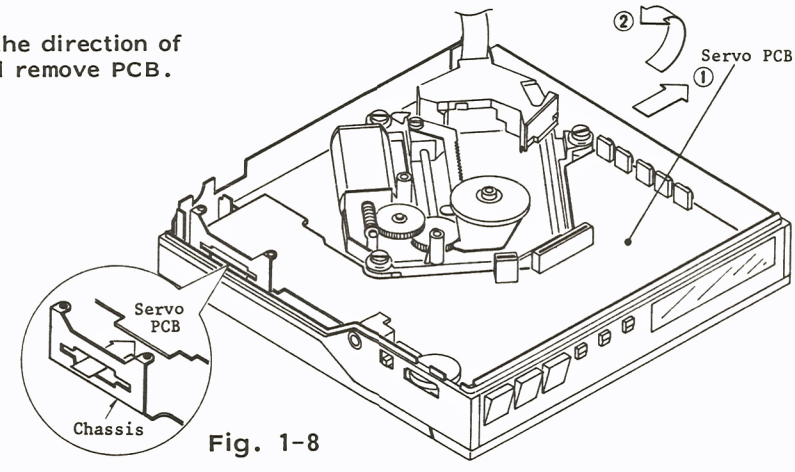


Fig. 1-8

(d) Assemble the spindle PCB which is removed as in Para.⑥- (a), to the former status.

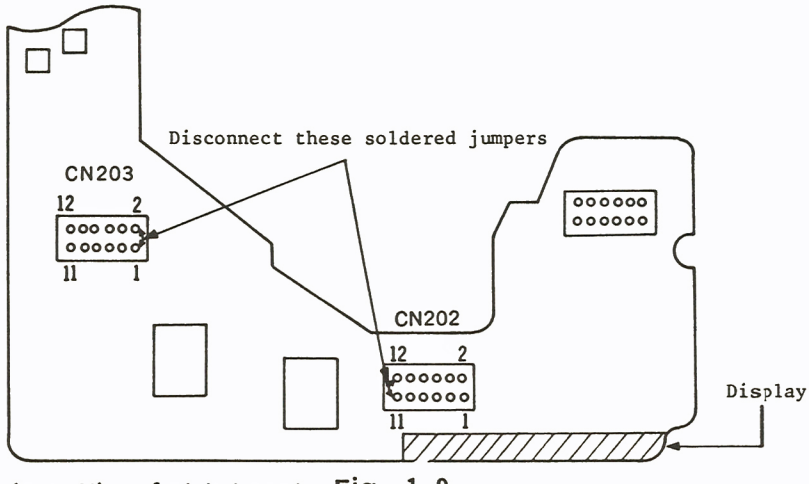
(3) Set up the player with the special tools so that power-on check can be carried out.

①Desolder the jumpers connecting the pins 11 and 12 of the connector CN202 of the digital PCB, and the pins 1 and 2 of the connector CN203.

①Die Schaltdrähte zwischen des Kontakten 11 und 12 des Steckers CN202 der Digital-Schalttafel und den Kontakten 1 und 2 des Steckers CN 203 ablöten.

①Dessouder les jarretières raccordant les broches 11 et 12 du connecteur CN202 de la plaquette à circuits imprimés numérique, et les broches 1 et 2 du connecteur CN203.

①Desoldar los puentes que conectan las espigas 11 y 12 del conector CN203 de la TCI digital, y las espigas 1 y 2 del conector CN203.



(Rear View of Digital PCB) Fig. 1-9

[(Disconnection is just for servicing. Restore the jumpers on completion of repair.)]

[(Das Abnehmen ist nur zu Wartungszwecken. Nach der Reparatur wieder anschließen.)]

[(La déconnexion n'est seulement que pour la réparation. Remettre en place les jarretières, une fois terminée la réparation.)]

[(La desconexión se hace sólo para el servicio. Volver a montar los puentes de contacto al acabar la reparación).]

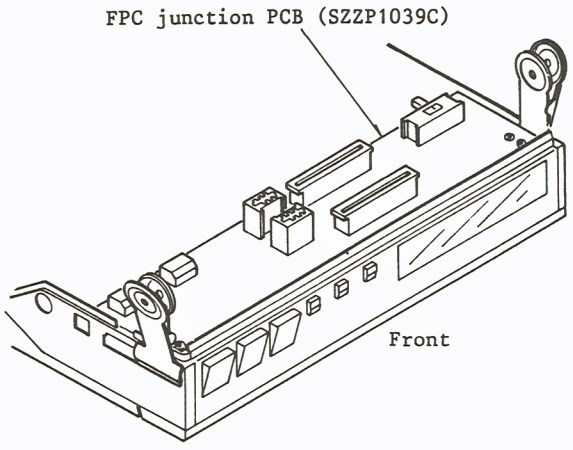


Fig. 1-10

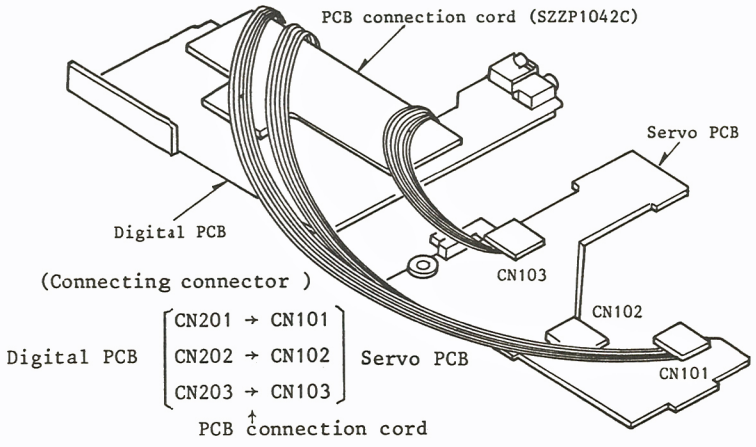


Fig. 1-11

② Install the FPC junction PCB in place shown in Fig. 1-10.

③ Connect the digital PCB and the servo PCB with the PCB connection cord without confusing the connecting connectors as shown in Fig. 1-11.

(Note)
Connect the cables in parallel so that they shall not cross each other.
(Repeatedly it is advised not to confuse the connecting connectors because both of them are 12-pin connectors.)

(Hinweis)
Die Kabel parallel und nicht über Kreuz anschließen.
(Es wird darauf hingewiesen, die Stecker nicht zu verwechseln, da beide 12-wertig sind.)

(Nota)
Raccorder les câbles en parallèle de telle sorte qu'ils ne se croisent pas mutuellement.
(Il est recommandé, une fois de plus, de ne pas confondre les connecteurs de raccordement car tous deux sont des connecteurs à 12 broches.)

(Nota)
Conectar los cables paralelamente, de manera que no se crucen unos con otros.
(Avisamos repetidamente que se tenga cuidado de no confundirse al conectar los conectores, ya que ambos son de 12 espigas).

④ Connect the FPC extension cords (SZZP1040C and SZZP1041C) completely between the FPC junction PCB and the servo PCB as shown in Fig. 1-12.

(Note)
Don't confuse the orientations of the reinforcement side and the foil side of the FPC extension cord.

(Hinweis)
Die verstärkte Seite und die Folienseite des Schaltbrett-Verlängerungskabels dürfen nicht verwechselt werden.

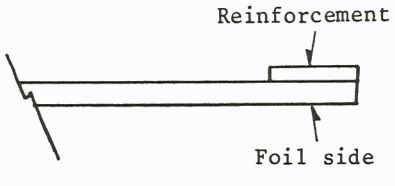
(Nota)
Ne pas se tromper dans l'orientation du côté du renforcement et du côté de l'armature du câble de prolongement de FPC (circuit imprimé flexible).

(Nota)
No confundir las direcciones del lado de refuerzo y el lado de la hoja conductiva del cable de extensión de la tablilla flexible de circuítos impresos CIF.

⑤ Connect the two 4-pin connectors (extensions of CN106 and CN107 of the FPC junction PCB) to the connectors of the servo PCB similarly.

⑥ Connect the FPC extension cords and the 4-pin connectors led from the set to the junction PCB.

(Note) Don't confuse the orientation of FPC Cords.



(Note)
Disconnect FPC after lifting up the lock housing section connector used for the FPC junction PCB (SZZP1039C).

(Hinweis)
Den Stecker des Riegelgehäuses am Anschluß FCP zu PCB (SZZP1039C) anheben und FPC ausstecken.

(Nota)
Déconnecter le circuit imprimé flexible (FPC) après le soulèvement du connecteur de la section du boîtier de blocage utilisé pour la plaquette à circuits imprimés de jonction du circuit imprimé flexible (SZZP1039C).

(Nota)
Desconectar la CIF después de levantar lel conector de sección de la caja de cierre usado en el CIF de la TCI (SZZP1039C).

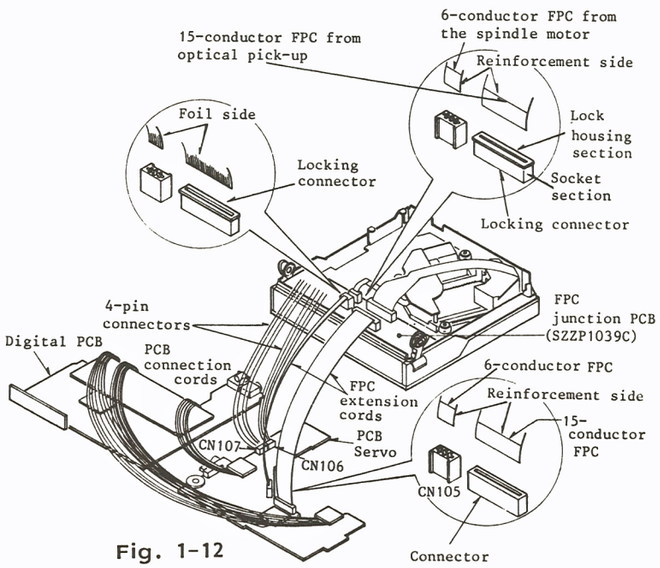


Fig. 1-12

⑦ Set the switches of the PCB connection cord and the FPC junction PCB as illustrated in Fig. 1-13.

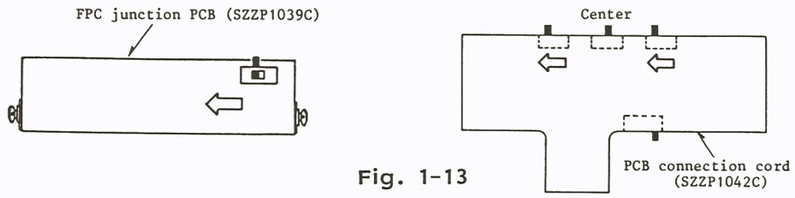
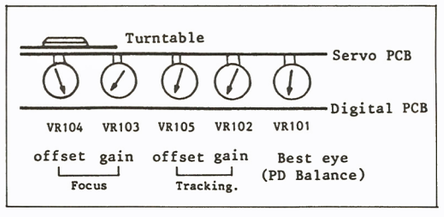


Fig. 1-13

⑧ Ensure that the power switch is turned off, and connect the AC adaptor (SH-CDA3U).

⑨ Place the disc in the tray and turn on the power switch.

(4) Initial setting points of adjusting variable resistors



- Adjusting variable resistors

The player operates but not optimum at the above settings of the adjusting variable resistors. Adjust them according to the adjusting procedure. Must conduct the electrical adjustment when any electrical part is replaced. Perform 1 optical pick-up adjustment and 2 electric adjustment in the stated order when the optical pick-up is replaced.

- Einstellung der Regelwiderstände

Das Gerät funktioniert bei der oben dargestellten Einstellung der Regelwiderstände, aber nicht optimal. Gemäß dem Einstellvorgang einstellen. Die elektrische Einstellung muß immer vorgenommen werden, wenn ein Teil ausgetauscht wird. Nach dem Auswechseln des optischen Abnehmers ① Einstellung des optischen Abnehmers und ② die elektrische Einstellung in dieser Reihenfolge vornehmen.

- Réglage des résistances variables

L'appareil fonctionne, mais non dans les conditions optima des réglages précédents des résistances variables d'ajustement. Les régler selon la procédure d'ajustement. On devra réaliser un réglage électrique lorsque n'importe quel élément électrique est remplacé. Effectuer ① réglage de la tête de lecture optique et ② le réglage électrique dans l'ordre indiqué lorsqu'on remplace la tête de lecture optique.

- Ajuste de las resistencias variables

Si tocadiscos opera de forma anormal con dichos ajustes de los resistores variables, ajustarlos según el procedimiento de ajuste. Se hará el ajuste eleéctrico cuando se cambie cualquier pieza eléctrica. Ajustar el captador óptico y dos ajustes eléctricos en dicho orden cuando se cambie el captador óptico.

=CAUTION=

1. Classification of the printed Circuit board (Digital and Servo)

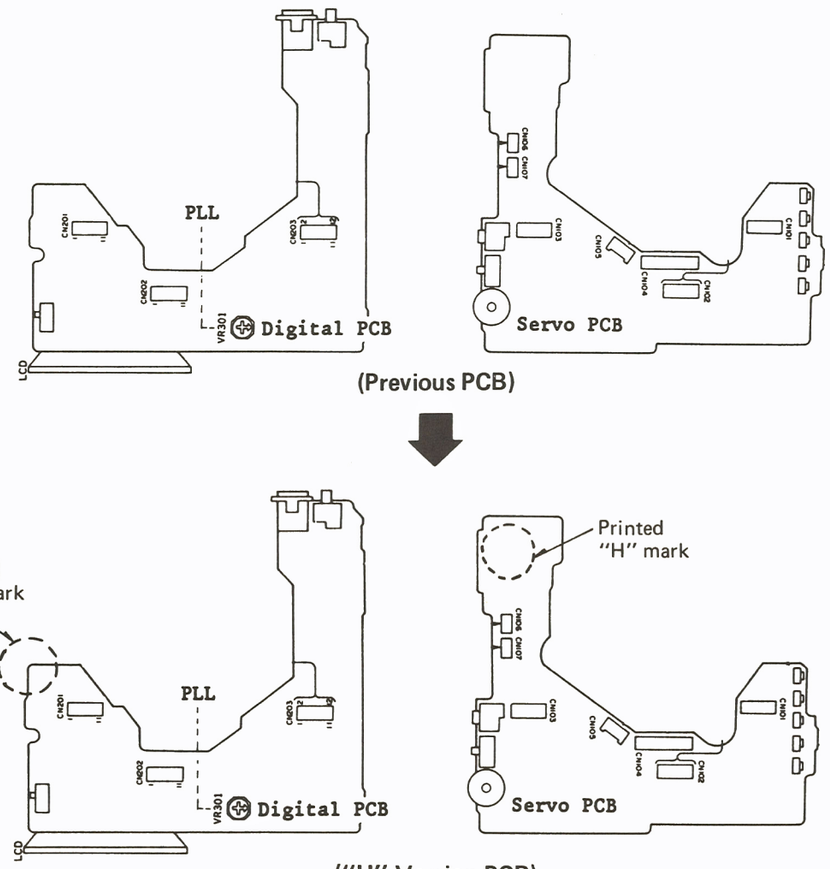


Fig. 1-14 PCB Classification

2. Setting position of the PCB mode switch

Set the PCB mode switch of the PCB connection cord (SZZP1042C) as shown in Fig. 1-15.

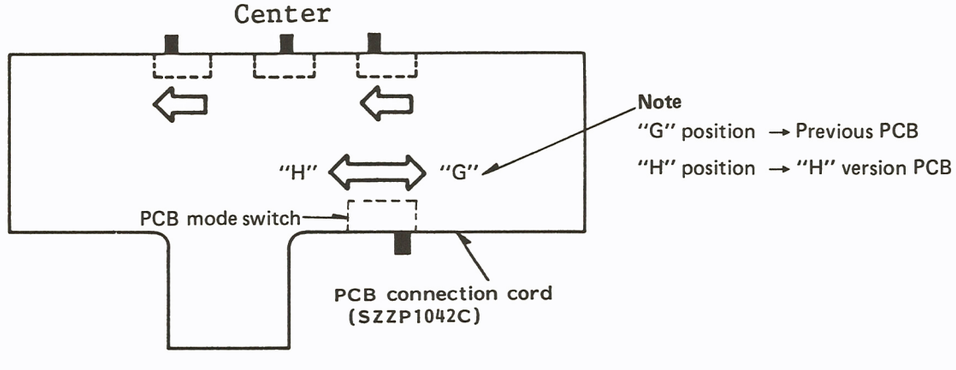
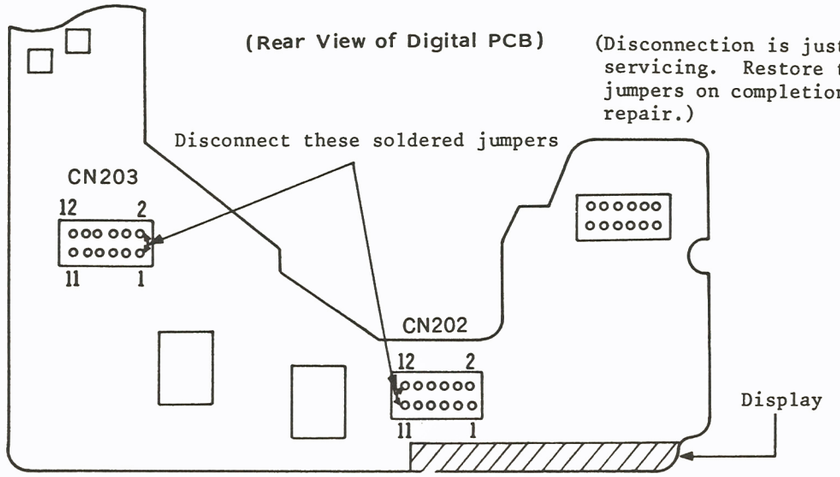


Fig. 1-15 Setting position

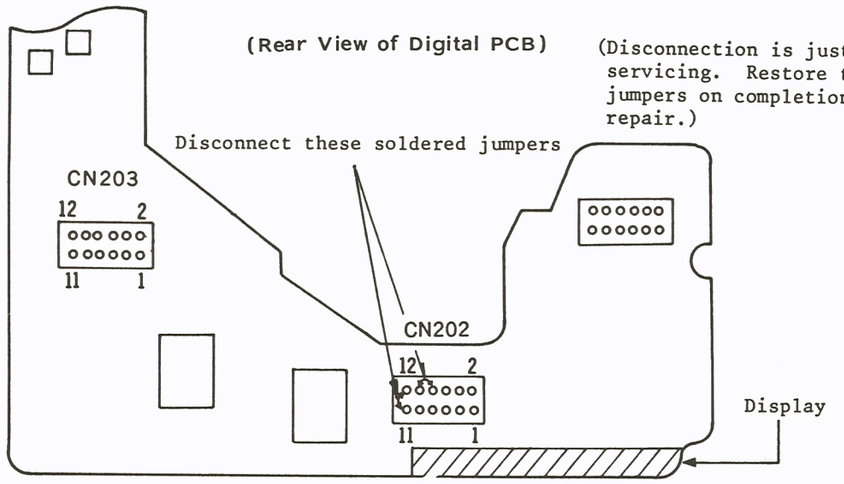
3. Desoldering position for the only servicing

Desolder the jumpers connecting the pins 11 and 12 of the connector CN202 of the digital PCB, and the pins 1 and 2 of the connector CN203.



(Previous Digital PCB)

If the PCB is "H" version (Printed on the PCB... as shown in Fig. 1-14). It should be desolder the jumper connecting the pins 8 and 10 also pins 11 and 12 of the connector CN202 of the digital PCB.



("H" Version Digital PCB)

	Previous Digital PCB	"H" Version Digital PCB
(1)	CN202 ⑪ – ⑫ pin	CN202 ⑪ – ⑫ pin
(2)	CN203 ① – ② pin	CN202 ⑧ – ⑩ pin

Fig. 1-16 Desoldering position

2. ADJUSTMENT PROCEDURE 2. PROCEDURE POUR LE REGLAGE
2. EINSTELLVORGANG 2. PROCEDIMIENTO DE AJUSTE

2-1. Electrical Adjustment

(1) Measuring Instruments and Tools

① 2-channel oscilloscope (with external trigger, 30 MHz or over).
② Low frequency oscillator (Audio used).
③ Screwdriver for watch (Hozantool No. D22 + No.0. - 2mm)
④ Hexagonal Wrench (Hozan tool No.W91·1.5mm)
⑤ Other common tools

2-1. Elektrische Einstellung

(1) Instrumente und Werkzeuge

① 2-Kanal-Oszilloskop (mit externem Auslöser, 30 MHz oder mehr).
② Niederfrequenz-Oszillator (für Audio).
③ Uhrwerkschraubenzieher (Hozan-Werkzeug Nr. D22 + Nr. 0 - 2mm)
④ Inbus-Schlüssel (Hozan-Werkzeung Nr. W91 · 1,5mm)
⑤ Andere übliche Werkzeuge

(2) Adjusting Sequence and Locations

(2) Einstellvorgang und Lagebeschreibungen

2-1. Réglage électrique

(1) Appareils et outils de mesurage

① Oscilloscope à double canal (avec déclenchement extérieur; 30 MHz ou plus.)
② Oscillateur à basse fréquence (utilisation audio).
③ Tournevis pour l'horloge (Outil Hozan N° D22 + N° 0. - 2 mm).
④ Clé hexagonale (Outil Hozan N° W91.1,5mm).
⑤ Autres outils ordinaires

2-1 Ajuste eléctrico

(1) Instrumentos y herramientas de medición

① Osciloscopio de dos canales (con disparador exterior, de 30 MHz o más)
② Oscilador de baja frecuencia (para uso de audio)
③ Destornilladores de relojero (Herramienta Hozan No.D22 + No.0 - 2mm)
④ Llave allen (Herramienta Hozan No.W91 1,5mm)

(2) Séquence de réglage et emplacements

(2) Otras herramientas

• Set up the player according to the disassembly procedure outlined in Para. 1 so that power-on check can be made.	• Installer l'appareil selon la procédure de démontage indiquée dans le Paragraphe 1, de telle sorte qu'une vérification de mise sous tension puisse être réalisée.	
• Das Gerät gemäß der Zerlegungsbeschreibung in Abschn. 1 so vorbereiten, daß es in Betrieb überprüft werden kann.	• Fijar el tocadiscos de acuerdo con el procedimiento de desarmado descrito en el párrafo 1, de manera que se pueda hacer la verificación de conexión con la fuente de energía.	
▼		
• Focus offset adjustment • Einstellung des Fokusausgleichs	• Réglage du décentrement de focalisation • Ajuste de desenfoque	.... VR104
▼		
• Tracking offset adjustment • Einstellung des Spurausgleichs	• Réglage du décentrement de focalisation • Ajuste de desvío de trayectoria	.... VR105
▼		
• Focus gain adjustment • Einstellung der Fokusverstärkung	• Réglage de l'amplification de focalisation • Ajuste de ganancia de foco	.... VR103
▼		
• Tracking gain adjustment • Einstellung der Spurtreue	• Réglage de l'amplification d'alignement • Ajuste de ganancia de trayectoria	.... VR102
▼		
• Best eye adjustment • Einstellung des Lichtdetektors	• Réglage visuel le meilleur • Mejor ajuste ocular	.... VR101
▼		
• Adjustment of offset at drop out • Einstellung des Ausgleichs bei Abfallwerten	• Réglage de décentrement lors d'une chute (de son) • Ajuste de disparo de cortocircuito	.... VR104
▼		
• PLL adjustment • PLL-Einstellung	• Réglage du circuit d'asservissement de phase • Ajuste PLL	.... VR301
▼		
• Play check • Überprüfung der Wiedergabe	• Vérification de l'audition • Audición	

(3) Location of Adjusting Variable Reistors of each PCB.
(3) Lage der Regelwiderstände der einzelnen Schaltplatten (PCB)
(3) Emplacement des résistances variables de réglage de chaque plaquette à circuits imprimés
(3) Localización de cada resistencia variable de cada TCI. (Tablilla de circuitos impresos)

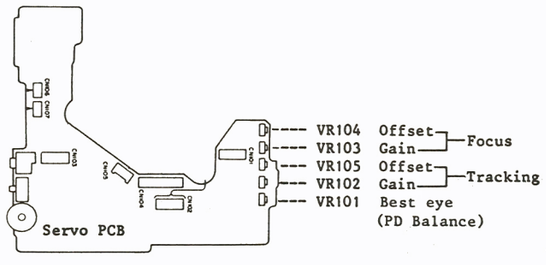


Fig. 2-1

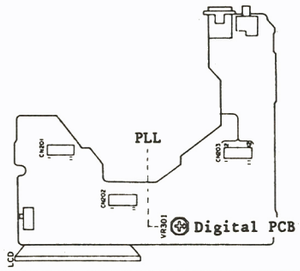


Fig. 2-2

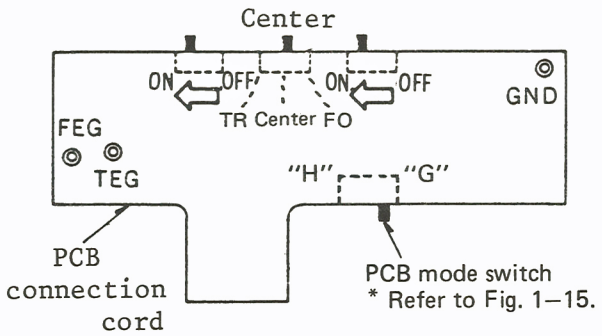


Fig. 2-3

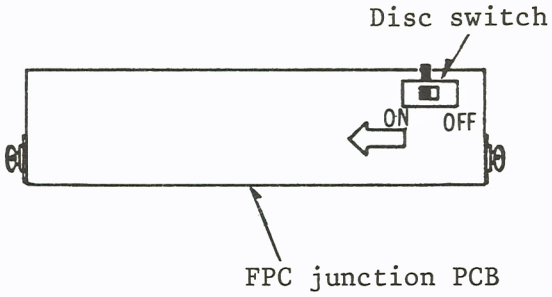


Fig. 2-4

ENGLISH

(4) Electrical Adjustment

A. Focus Offset Adjustment

① Position the switches of the PCB connection cord as illustrated in Fig. 2-3.
② Set the input selector switch of the oscilloscope to the GROUND position for zero balancing.
③ Connect the oscilloscope to the FEG and GND terminals of the PCB connection cord.

Oscilloscope setting
- VOLT 100mV
- SWEEP ..... 1msec.
- Input selector ..... D.C.

④ Place the test disc (SZZP1014F), switch on the power supply to set the player to the playing status.
⑤ Set the disc switch of the FPC junction PCB to the OFF position.
⑥ Adjust VR104 so that the DC voltage indicated on the oscilloscope shall be 0 V.
⑦ On completion of adjustment, set the disc switch to the ON position.
⑧ Set the power supply switch to the OFF position.

FRANÇAIS

(4) Plaquette à circuits imprimés numérique

A. Réglage électrique

① Positionner les commutateurs du câble de raccordement de la plaquette à circuits imprimés selon l'illustration de la Fig. 2-3.
② Régler le commutateur-sélecteur d'entrée de l'oscilloscope sur la position GROUND (terre) pour un équilibrage sur zéro.
③ Raccorder l'oscilloscope aux bornes FEG et GND (terre) du câble de raccordement de la plaquette à circuits imprimés.

Réglages de l'oscilloscope
- TENSION 100mV
- BALAYAGE ..... 1msec.
- Sélecteur d'entrée ..... C.C.

④ Installer le disque d'essai (SZZP1014F) et mettre en circuit l'alimentation en courant pour placer l'appareil sur une condition de lecture.
⑤ Régler le commutateur pour disque de la plaquette à circuits imprimés de la jonction du circuit imprimé flexible (FPC) sur la position "OFF" (hors circuit).
⑥ Ajuster VR104 de telle sorte que la tension C.C. indiquée sur l'oscilloscope soit de 0 V.
⑦ Une fois achevée la mise au point, régler le commutateur pour disque sur la position "ON" (en circuit).
⑧ Régler l'interrupteur d'alimentation en courant sur la position OFF (hors circuit).

DEUTSCH

(4) Elektrische Einstellung

A. Einstellung des Fokusausgleichs

① Stellung der Schalter des Schaltplatten-Kabels wie in Abb. 2-3.
② Den Eingangsumschalter des Oszilloskops für O-Balance auf GROUND stellen.
③ Das Oszilloskop an die Klemmen FEG und GND des Schaltplatten-Kabels anschließen.

Einstellung des Oszilloskops
- SPANNUNG 100mV
- ABLENKUNG..... 1ms
- Eingangsumschalter .....Gleichstrom

④ Testdisk (SZZP1014F) einlegen und Stromversorgung einschalten, damit das Gerät spielbereit ist.
⑤ Den Diskschalter auf der FPC-Anschluß-Schaltplatte auf "OFF" stellen.
⑥ VR 104 so einstellen, daß die Gleichstromspannung auf dem Oszilloskop mit 0V angezeigt wird.
⑦ Nach erfolgter Einstellung den Diskschalter auf "ON" stellen.
⑧ Netzschalter auf "OFF" stellen.

ESPAÑOL

(4) Ajuste eléctrico

A. Ajuste de desenfoque

① Poner los interrupotres de la conexión de la TCI como se ve en la Fig. 2-23.
② Fijar el interruptor selector del osciloscopio en la posición de tierra para el balance de cero.
③ Conectar el osciloscopio a los terminales de FEG y TIERRA del cable de conexión de la TCI.

Fijación del osciloscopio
- VOLTAJE 100mV
- BARRIDO ..... 1mseg.
- Selector de potencia de entrada ... CD

④ Poner la disqueta (SZZP1014F), y encender el interruptor de fuente de energía para que el tocadiscos esté en condiciones de funcionar
⑤ Fijar el interruptor de disco de la juntura FPC de la TCI en la posición de APAGADO.
⑥ Ajustar VR104 de manera el voltaje de CD indicado en el osciloscopio sea 0V.
⑦ Al completar el ajuste, fijar el interruptor de disco en la posición ENCENDIDO.
⑧ Poner el interruptor de la fuente de energía en la posición de APAGADO.

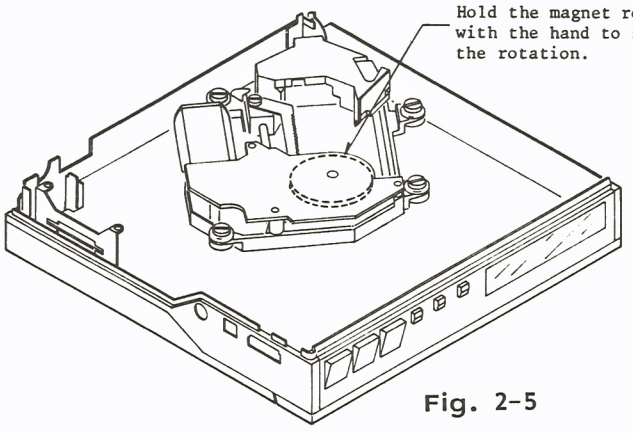


Fig. 2-5

Adjust so that this portion
shall be about 0 V.

Fig. 2-6

B. Tracking offset Adjustment

① Set the switches of the PCB connection cord in the same positions as in the focus offset adjustment.
② Connect the oscilloscope to the terminals TEG and GND of the PCB connection cord. (The oscilloscope must have been zero-balance adjusted.)

Oscilloscope setting
- VOLT 100mV
- SWEEP ..... 1 msec.
- Input selector..... D.C

③ Turn on the power supply switch.
④ Place the test disc (SZZP1014F) and play the outermost track.
⑤ If the player starts play, hold the magnet rotor of the spindle motor (shown in Fig. 2-5) with the hand to stop the rotation.
⑥ Adjust VR105 so that the center of the DC waveforms displayed on the oscilloscope shall be 0 V.
⑦ Set the power supply switch to the OFF position.

B. Réglage du décentrement d'alignement

① Régler les commutateurs du câble de raccordement de la plaquette à circuits imprimés dans les mêmes positions que pour le réglage du décentrement de focalisation.
② Raccorder l'oscilloscope aux bornes TEG et GND (terre) du câble de raccordement de la plaquette à circuits imprimés. (L'oscilloscope devra être réglé pour un équilibrage sur zéro.)

Réglages de l'oscilloscope
- TENSION ..... 100 mV
- BALAYAGE ..... 1 msec
- Sélecteur d'entrée ..... C.C

③ Mettre en marche l'interrupteur d'alimentation en courant.
④ Installer le disque d'essai (SZZP1014F) et faire jouer la piste la plus à l'extérieur.
⑤ Si le lecteur commence à fonctionner, tenir le rotor magnétique du moteur à axe (montré à la Fig. 2-5) avec la main pour arrêter la rotation.
⑥ Régler VR105 de telle sorte que le centre des formes d'ondes C.C. affichées sur l'oscilloscope soit de 0 V.
⑦ Régler le commutateur de l'alimentation en courant sur la position OFF (hors circuit).

B. Einstellung des Spurausgleichs

① Die Schalter des Schaltplatten-Verbindungskabels genauso stellen wie bei der Einstellung des Fokusausgleichs.
② Das Oszilloskop an die Klemmen TEG und GND des Schaltplatten-Verbindungskabels anschließen. (Das Oszilloskop muß auf O-Balance eingestellt sein.)

Einstellung des Oszilloskops
- SPANNUNG 100mV
- ABLENKUNG..... 1ms
- Eingangsumschalter ..... Gleichstrom

③ Netzschalter "EIN"
④ Testdisk (SZZP1014F) einlegen und die äußberste Spur abspielen.
⑤ Wenn das Gerät anfängt zu spielen, mit der Hand den Magnetläufer festhalten, so daß er sich nicht mehr drehen kann (s. Abb. 2-5).
⑥ VR105 so einstellen, daß das Zentrum der Gleichstromsignale auf dem Oszilloskop oV ist.
⑦ Netzschalter auf "AUS" stellen.

B. Ajuste de desvío de trayectoria

① Fijar los interruptores del cable de conexión de la TCI en las mismas posiciones del ajuste de desenfoque.
② Conectar el osciloscopio a los terminales TEG(G) o TED (H) y TIERRA del cable de conexión de la TCI. (El osciloscopio tiene que estar ajustado a cero).

Fijación del osciloscopio
- VOLTAJE 100mV
- BARRIDO ..... 1 mseg.
- Selector de potencia de entrada .. DC

③ Encender el interruptor de la fuente de energía
④ Poner la disqueta de prueba (SZZP1014F) y oir la pista más exterior.
⑤ Si el disco comienza la audición, mantener el rotor magnético del motor de vástago (que se muestra en la Fig. 2-5) con la mano para parar la rotación.
⑥ Ajustar VR105 para que el centro de las formas de onda CD que se muestran en el osciloscopio sean de 0V.
⑦ Poner el interruptor de fuente de energía en posición de APAGADO.

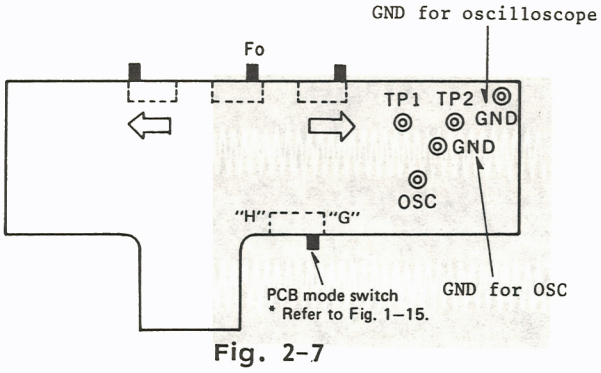


Fig. 2-7

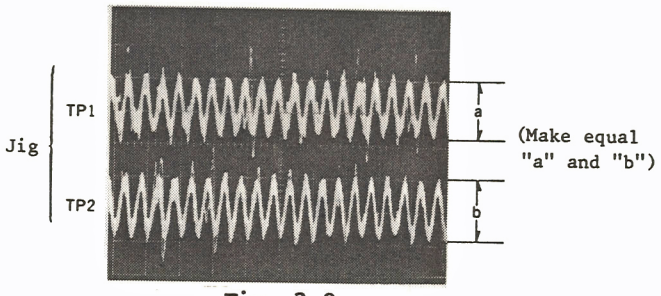


Fig. 2-8

C. Focus Gain Adjustment

① Set the switches of the PCB connection cord as illustrated in Fig. 2-7.
② Connect CH1 and CH2 of the oscilloscope to the terminals TP1, TP2, and GND of the PCB connection cord.

Oscilloscope setting
- VOLT ..... 100 mV
- SWEEP ..... 5 msec.
- Input selector ..... A.C.

③ Connect the low frequency oscillator set to 1 kHz and 150 mVp-p to the terminals OSC and GND of the PCB connection cord.
④ Turn on the power supply switch.
⑤ Place the test disc (SZZP1014F) and set the player to the playing condition.
⑥ 1 kHz signal will be displayed on the oscilloscope. Adjust VR103 so that the amplitudes of two channels shall be equal.
⑦ Turn off the power supply switch.

C. Réglage de l'amplification de focalisation

① Régler les commutateurs du câble de raccordement de la plaquette à circuits imprimés comme il est illustré à la Fig. 2-7.
② Raccorder le canal 1 et le canal 2 de l'oscilloscope aux bornes TP1, TP2 et GND (terre) du câble de raccordement de la plaquette à circuits imprimés.

Réglages de l'oscilloscope
- TENSION ..... 100 mV
- BALAYAGE ..... 5 msec.
- Sélecteur d'entrée ..... C.A.

③ Raccorder l'oscillateur de basse fréquence, réglé sur 1 kHz et 150 mV crête-à-crête, aux bornes OSC (oscillateur) et GND (terre) du câble de raccordement de la plaquette à circuits imprimés.
④ Mettre en marche l'interrupteur d'alimentation en courant.
⑤ Placer le disque d'essai (SZZP1014F) et régler le lecteur pour une condition d'audition.
⑥ Un signal de 1 kHz sera affiché sur l'oscilloscope. Régler VR103 de telle sorte que l'amplitude des deux canaux soit égale.
⑦ Mettre hors circuit l'interrupteur d'alimentation en courant.

C. Einstellung der Fokusverstärkung

① Die Schalter auf dem Schaltplatten-Verbindungskabel wie in Abb. 2-7 stellen.
② CH-1 und CH-2 des Oszilloskops an die Klemmen TP1, TP2 und GND des Schaltplatten-Verbindungskabels anschließen.

Einstellung des Oszilloskops
- SPANNUNG ..... 100 mV
- ABLENKUNG ..... 5 ms
- Eingangsumschalter ..... Wechselstrom

③ Den Niederfrequenz-Oszillator auf 1 KHz und 150 mVp-p stellen und an die Klemmen OSC und des Schaltplattenverbindungskabels anschließen.
④ Netzschalter auf "EIN" stellen.
⑤ Testdisk (SZZP1014F) einlegen und das Gerät auf Wiedergabe schalten.
⑥ Ein 1 kHz-Signal wird auf dem Oszilloskop dargestellt. VR 103 so einstellen, daß die Amplitüden beider Kanäle gleich sind.
⑦ Netzschalter auf "AUS" stellen.

C. Ajuste de ganancia de foco

① Fijar los interruptores del cable de conexión de la TCI como en la Fig. 2-7.
② Conectar los CANALES 1 y 2 del oscilloscopio a los terminales TP1 y TP2 y TIERRA del cable de conexión de la TCI.

Fijación del osciloscopio
- VOLTAJE ..... 100 mV
- BARRIDO ..... 5 mseg.
- Selector de potencia de entrada ... CA

③ Conectar el oscilador de baja frecuencia fijado en 1 kHz y 150 kVp-p a los terminales OSC y TIERRA del cable de conexi'on de la TCI.
④ Encender el interrutor de la fuente de energía.
⑤ Poner la disqueta de prueba (SZZP1014F) y fijar el tocadiscos en el modo de audición.
⑥ En el osciloscopio se mostrará una señal de 1kHz. Ajustar VR103 de manera que la amplitud de los dos canales sea igual.
⑦ Apagar el interruptor de la fuente de energía.

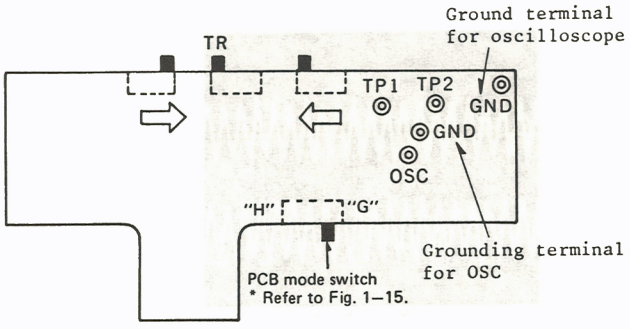


Fig. 2-9

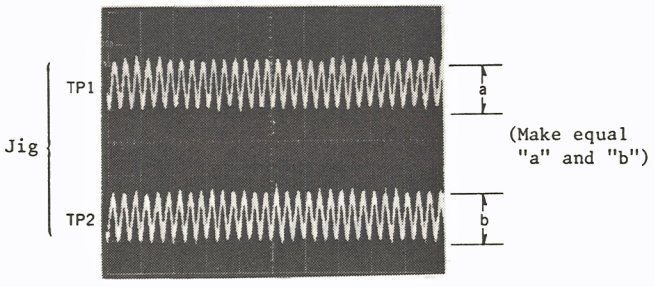


Fig. 2-10

D. Tracking Gain Adjustment

① Set the switches of the PCB connection cord as shown in Fig. 2-9.
② Connect CH1 and CH2 of the oscilloscope to the terminals TP1 and TP2 of the PCB connection cord.

Oscilloscope setting
- VOLT 100mV
- SWEEP ..... 5 msec.
- Input selector ..... A.C

③ Connect the low frequency oscillator set to 1.5 kHz and 150 mV_{p-p} to the terminals OSC and GND.
④ Turn on the power supply switch.
⑤ Place the test disc (SZZP1014F) and set the player to the playing condition.
⑥ 1.5 kHz signals are displayed on the oscilloscope. Adjust VR102 so that the amplitudes of waveforms of the two channels shall be equal as shown in Fig. 2-10.
⑦ Turn off the power supply switch.

D. Réglage de l'amplification d'alignement

① Régler les commutateurs du câble de raccordement de la plaquette à circuits imprimés comme il est montré à la Fig. 2-9.
② Raccorder le canal 1 et le canal 2 de l'oscilloscope aux bornes TP1 et TP2 du câble de raccordement de la plaquette à circuits imprimés.

Réglages de l'oscilloscope
- TENSION ..... 100 mV
- BALAYAGE ..... 5 msec.
- Sélecteur d'entrée ..... C.A.

③ Raccorder l'oscillateur de basse fréquence réglé sur 1,5 kHz et 150 mV crête-à-crête, aux bornes OSC (oscillateur) et GND (terre).
④ Mettre en marche l'interrupteur d'alimentation en courant.
⑤ Installer le disque d'essai (SZZP1014F) et régler le lecteur pour une condition d'audition.
⑥ Un signal de 1,5 kHz sera affiché sur l'oscilloscope. Régler VR102 de telle sorte que l'amplitude des formes d'ondes des deux canaux soit égale, comme il est montré à la Fig. 2-10.
⑦ Mettre hors circuit l'interrupteur d'alimentation en courant.

D. Einstellung des Spurausgleichs

① Die Schalter des Schalttafel-Verbindungskabels wie in Abb. 2-9 stellen.
② CH1 und CH2 des Oszilloskops an die Klemmen TP1 und TP2 des Schaltplatten-Verbindungskabels anschließen.

Einstellung des Oszilloskops
- SPANNUNG 100mV
- ABLENKUNG ..... 5 ms
- Eingangsumschalter ..... Wechselstrom

③ Niedrigfrequenz-Oszillator auf 1,5 KHz und 150 mV_{p-p} stellen und an die Klemmen OSC und GND anschließen.
④ Netzschalter auf "EIN" stellen.
⑤ Testdisk (SZZP1014F) einlegen und das Gerät auf Wiedergabe schalten.
⑥ Auf dem Oszilloskop sind 1,5 kHz-Signale dargestellt. VR 102 so einstellen, daß die Signalamplitüden auf beiden Kanälen gleich sind (s. Abb. 2-10).
⑦ Netzschalter auf "AUS" stellen.

D.Ajuste de Ganancia de Trayectoria

① Fijar los interruptores del cable de conexión de la TCI como en la Fig. 2-9.
② Conectar los CANALES 1 y 2 del osciloscopio a los terminales TP1 y TP2 del cable de conexión d la TCI.

Fijación del osciloscopio
- VOLTAJE 100mV
- BARRIDO ..... 5 mseg.
- Selector de potencia de entrada.. CA

③ Conectar el oscilador de baja frecuencia fijado en 1,5 kHz y 150 mVp-p a los terminales OSC y TIERRA.
④ Encender el interruptor de fuente de energía.
⑤ Poner la disqueta de prueba (SZZP1014F) y fijar el tocadiscos en la condición de audición.
⑥ En el osciloscopio se muestra una señal de 1,5 kHz. Ajustar VR102 de manera que las amplitudes de las formas de onda de los dos canales sean iguales a las de la Fig. 2-10.
⑦ Encender el interruptor de la fuente de energía.

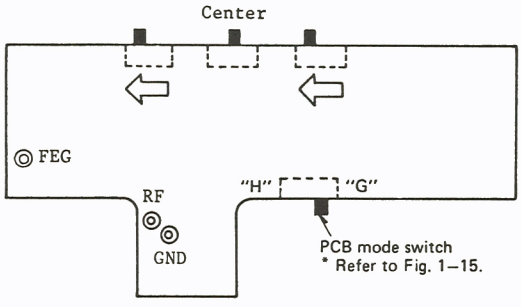


Fig. 2-11

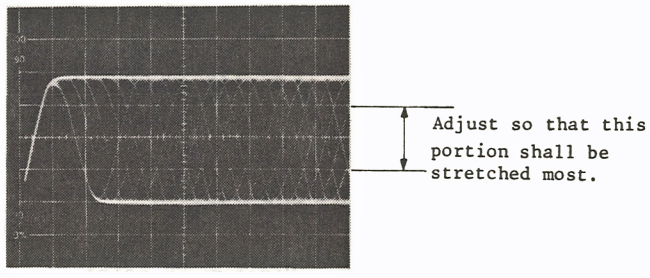


Fig. 2-12

E. Best Eye Adjustment (PD Balance)

① Position the switches of the PCB connection cord as illustrated in Fig.2-11.
② Connect the oscilloscope to the terminals RF and GND of the PCB connection cord.

Oscilloscope setting
VOLT..... 200mV
SWEEP..... 0.5μsec.
Input selector..... A.C

③ Turn on the power supply switch.
④ Place the test disc (SZZP1014F) and set the player to the playing condition.
⑤ The RF signal is indicated on the oscilloscope. Adjust VR101 so that the eye pattern shall be stretched most as illustrated in Fig. 2-12.
⑥ Turn off the power supply switch.

E. Réglage visuel le meilleur (Equilibrage du détecteur optique)

① Positionner les commutateurs du câble de raccordement de la plaquette à circuits imprimés comme il est illustré à la Fig. 2-11.
② Raccorder l'oscilloscope aux bornes RF (haute fréquence) et GND (terre) du câble de raccordement de la plaquette à circuits imprimés.

Réglages de l'oscilloscope
TENSION ..... 200 mV
BALAYAGE ..... 0,5 μsec.
Sélecteur d'entrée..... C.A.

③ Mettre l'interrupteur d'alimentation en courant en marche.
④ Installer le disque d'essai (SZZP1014F) et régler le lecteur pour une condition d'audition.
⑤ Le signal de haute fréquence sera indiqué sur l'oscilloscope. Régler VR101 de telle sorte que l'oscillogramme visuel soit étiré au maximum, comme il est illustré à la Fig. 2-12.
⑥ Mettre hors circuit l'interrupteur d'alimentation en courant.

E. Einstellung des Lichtdetektors (Best eye)

① Die Schalter des Schaltbrett-Verbindungskabels wie in Abb. 2-11 einstellen.
② Das Oszilloskop an die Klemmen RF und GND des Schaltbrettverbindungskabels anschließen.

Einstellung des Oszilloskops
SPANNUNG 200mV
ABLENKUNG ..... 0,5 μs
Eingangsumschalter..... Wechselstrom

③ Netzschalter auf "EIN" stellen.
④ Testdisk (SZZP1014F) einlegen und das Gerät auf Wiedergabe schalten.
⑤ Auf dem Oszilloskop ist das RF-Signal dargestellt. VR 101 so einstellen, daß das Augenmuster so gedehnt wie möglich erscheint (s. Abb. 2-12).
⑥ Netzschalter auf "AUS" stellen.

E. Ajuste de regulación ocular (Balance del detector óptico)

① Poner los interruptores del cable de conexión de la TCI como en la Fig. 2-11.
② Conectar el osciloscopio a los terminales RF y TIERRA del cable de la TCI.

Fijación del osciloscopio
VOLTAJE..... 200 mV
BARRIDO ..... 0,5 μseg.
Selector de potencia de entrada... CA

③ Encender el interruptor de la fuente de energía.
④ Poner la disqueta (SZZP1014F) y fijar el tocadiscos en la condición de audio.
⑤ EN el osciloscopio se indicará una señal RF. Ajustar VR101 de manera que la forma visual se alargue el máximo, como se muestra en la Fig. 2-12.
⑥ Apagar el interruptor de la fuente de energía.

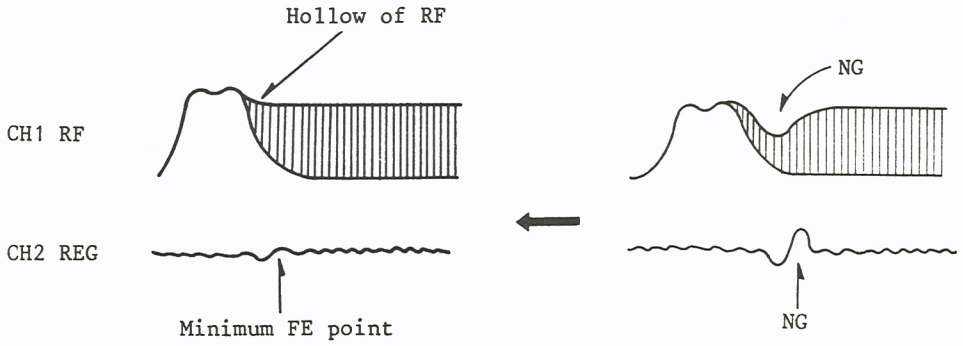


Fig. 2-13

F. Adjustment of Offset at Drop Out

① Position the switches of the PCB connection cord to the same positions as in best eye adjustment. (Refer to Fig. 2-11.)
② Connect CH1 of the oscilloscope to RF of the PCB connection cord and CH2 to FEG.

Oscilloscope setting
- VOLT 0.5V
- SWEEP ..... 0.5msec.
- Input selector ..... A.C
- Trigger ..... CH1, NORM

③ Turn on the power supply switch.
④ Play back the band 8 or 13 (0.5 mm black spot) of the test disc (SZZP1014F).
⑤ Trigger so that the waveform shown in Fig.2-13 is displayed on the oscilloscope and adjust VR104 so that the hollow of RF and the waveform amplitude of FE shall be minimum.
⑥ Turn off the power supply switch.

F. Réglage du décentrement lors d'une chute (de son)

① Positionner les commutateurs de câble du raccordement de la plaquette à circuits imprimés dans les mêmes positions que pour le réglage visuel le meilleur. (Se référer à la Fig.2-11.)
② Raccorder le canal 1 de l'oscilloscope à la borne RF (haute fréquence) du câble de raccordement de la plaquette à circuits imprimés et le canal 2 à FEG.

Réglages de l'oscilloscope
- TENSION ..... 0,5 V
- BALAYAGE ..... 0,5 msec.
- Sélecteur d'entrée ..... C.A.
- Déclencheur ..... Canal 1, NORM

③ Mettre en marche l'interrupteur d'alimentation en courant.
④ Faire jouer la plage 8 ou 13 (inversion d'interférence de 0,5 mm) du disque d'essai (SZZP1014F).
⑤ Déclencher de telle sorte que la forme d'onde montrée à Fig. 2-13 soit affichée sur l'oscilloscope et régler VR104 de façon à ce que le creux de la haute fréquence et l'amplitude de la forme d'onde de FE (erreur de focalisation) soient au minima.
⑥ Mettre hors circuit l'interrupteur d'alimentation en courant.

F. Einstellung des Ausgleichs bei Abfallwerten

① Die Schalter des Schaltbrett-Verbindungskabels genau wie zur Einstellung des Lichtdetektors stellen (s. Abb. 2-11).
② CH-1 des Oszilloskops an RF des Schaltbrett-Verbindungskabels und CH-2 an FEG anschließen.

Einstellung des Oszilloskops
- SPANNUNG 0,5V
- ABLENKUNG 0,5ms
- Eingangsumschalter ..... Wechselstrom
- Auslöser ..... CH-1, NORM

③ Netzschalter auf "EIN" stellen.
④ Spur 8 oder 13 (0,5 mm schwarzer Fleck) des Testdisks (SZZP1014F) abspielen.
⑤ So auslösen, daß die Signalform von Abb. 2-13 auf dem Oszilloskop dargestellt wird; VR 104 so einstellen, daß die Senke von RF und die Signalamplitüde von FE minimal sind.
⑥ Netzschalter auf "AUS" stellen.

F. Ajuste de desigualdad de caída

① Poner los interruptores del cable de conexión de la TCI en las mismas posiciones que en el ajuste de regulación ocular. (Referirse a la Fig.2-11.)
② Conectar el CANAL 1 del osciloscopio a RF del cable de conexión de la TCI y el CANAL 2 a FEG.

Fijación del osciloscopio
- VOLTAJE 0,5V
- BARRIDO ..... 0,5 mseg.
- Selector de potencia de entrada ... CA
- Disparador ..... CANAL 1

③ Encender el interruptor de la fuente de energía.
④ Escuchar la audición de la banda 8 ó 13 (0,5mm Punto negro) de la disqueta de pruebas (SZZP1014F).
⑤ Hacer un disparo de manera que la forma de onda quese muestra en la Fig. 2-13 se muestre en el osciloscopio y ajustar VR104 de manera que el hueco de RF y la amplitud de la forma de onda de error de foco sea la mínima.
⑥ Apagar el interruptor de la fuente de energía.

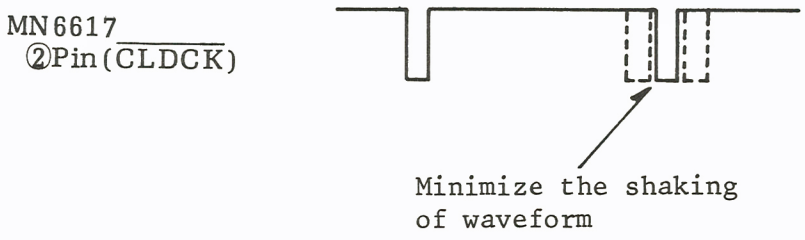


Fig. 2-14

G. PLL Adjustment

① Set the switches of the PCB connection cord to the same positions as in the adjustment of best eye. (Refer to Fig. 2-11.)
② Check the voltage at the pin ② (CLDCK) of LSI/IC-601 (MN6617) with the oscilloscope.

Oscilloscope setting
- VOLT. 2V
- SWEEP ..... 1msec.

③ Set the power supply switch to the ON position.
④ Play back the band 8 or 13 (0.5 mm black spot) of the test disc (SZZP1014F).
⑤ Adjust VR301 so that the shaking of waveform is eliminated or minimized as shown in Fig.2-14.
⑥ Turn off the power supply switch.

G. Réglage du circuit d'asservissement de phase

① Régler les commutateurs du câble de raccordement de la plaquette à circuits imprimés dans les mêmes positions que pour le réglage visuel le meilleur. (Se référer à la Fig. 2-11.)
② Vérifier la tension à la broche 2 (CLDCK) de l'intégration à grande échelle/circuit intégré-601 (MN6617) avec l'oscilloscope.

Réglages de l'oscilloscope
- TENSION ..... 2 V
- BALAYAGE ..... 1 msec.

③ Régler l'interrupteur d'alimentation sur la position "ON" (en circuit).
④ Faire jouer la plage 8 ou 13 (zone d'interférence de 0,5 mm) du disque d'essai (SZZP1014F).
⑤ Ajuster VR301 de telle sorte que la vibration de la forme d'onde soit éliminée ou réduite au minimum, comme il est montré à la Fig. 2-14.
⑥ Mettre hors circuit l'interrupteur d'alimentation en courant.

G. PLL-Einstellung

① Die Schalter des Schalttafel-Verbindungskabels genauso wie bei der Einstellung des Lichtdetektors stellen (s. Abb. 2-11).
② Mit dem Oszilloskop die Spannung an Stift 2 (CLDCK) von LSI/IC-601 (MN6617) überprüfen.

Einstellung des Oszilloskops
- SPANNUNG 2V
- ABLENKUNG 1ms

③ Netzschalter auf "EIN" stellen.
④ Spur 8 oder 13(0,5mm schwarzer Fleck) des Testdisks (SZZP1014F) abspielen.
⑤ VR 301 so einstellen, daß die Schwankungen der Signalform aufhören oder minimal sind (s. Abb. 2-14).
⑥ Netzschalter auf "AUS" stellen.

G. Ajuste de regulación de fase

① Fijar los interruptores del cable de conexión de la TCI en las mismas posiciones que en el ajuste de regulación ocular. (Referirse a la Fig.2-11)
② Verificar el voltaje de la espiga (2) (CLDCK) del LSI/CI-601 (MN6617) con el osciloscopio.

Fijación del osciloscopio
- VOLTAJE 2V
- BARRIDO ..... 1mseg.

③ Encender el interruptor de la fuente de energía.
④ Tocar la banda i ó 13 (punto negro 0,5 mm) de la disqueta de prueba (SZZP1014F).
⑤ Ajustar VR301 de manera que se elimine la desigualdad de onda o se minimice según la Fig. 2-14.
⑥ Apagar el interruptor de la fuente de energía.

H. Check of play operation after adjustment

Check of skip search
① Play an ordinary disc.
② Press the skip button and check to see that skip search is given. (Forward and reverse)

Check of manual search
① Play an ordinary disc
② Press the manual search button and check to see that smooth manual search can be done at low and high speeds. (Forward and reverse)

Check for defects
① Play the band 8 or 13 of test disc, (SZZP1014F) and check to see that there is no sound skip or noise. (Black spot --- 0.5 mm)
② Play the band 10 or 14 of test disc (SZZP1014F), and check to see that there is no sound skip or noise. (Finger print)

H. Vérification du fonctionnement de l'audition après le réglage

Vérification de la recherche par saut
① Faire jouer un disque normal.
② Appuyer sur la touche de saut (vers l'avant et vers l'arrière) et vérifier que la recherche par sauts soit obtenue.

Vérification de la recherche manuelle
① Faire jouer un disque normal.
② Appuyer sur la touche de recherche manuelle et vérifier si une recherche manuelle (vers l'avant et vers l'arrière) aisée et sans à-coups peut être effectuée à des vitesses faible et élevée.

Vérification pour des défauts
① Faire jouer la plage 8 ou 13 du disque d'essai (SSZP1014F) et vérifier qu'il n'y ait pas de parasites ou d'omission du son (zone d'interférence de 0,5 mm).
② Faire jouer la plage 10 ou 14 du disque d'essai (SZZP1014F) et vérifier qu'il n'y ait pas de parasites ou d'omission du son. (Marque de doigts)

H. Überprüfung der Wiedergabe nach Einstellung

Überprüfung der autom. Liedanfangsuche
① Einen normalen Disk abspielen.
② Autom. Suchknopf (skip search) drücken und vergewissern, daß die Suche durchgeführt wird. (Vorwärts und rückwärts)

Überprüfung der manuellen Liedanfangsuche
① Einen normalen Disk abspielen.
② Manuellen Suchknopf drücken und darauf achten, ob manuelle Suche bei hoher und normaler Geschwindigkeit reibungslos abläuft. (Vorwärts und rückwärts)

Fehlersuche
① Spur 8 oder 13 des Testdisks (SZZP1014F) abspielen und darauf achten, daß nichts übersprungen wird und keine Geräusche auftreten. (Schwarzer Fleck --- 0,5)
② Spur 10 oder 14 des Testdisks (SZZP1014F) abspielen und darauf achten, daß nichts übersprungen wird und keine Geräusche auftreten. (Fingerabdruck)

H. Verificar la operación de aucición después del ajuste

Verificar el rastreo de salto
① Tocar una disqueta ordinaria.
② Presionar el botón de salto y verificar si se realiza la función de rastreo de salto. (Avance y retroceso).

Verificar el rastreo manual
① Tocar una disqueta ordinaria
② Presionar el botón de rastreo manual y verificar si se realiza suavemente esta función en velocidades lentas y rápidas (Avance y retroceso).

Verificar si hay defectos
① Tocar la banda 8 ó 13 de la disqueta de prueba (SZZP1014) y verificar si hay ruidos, saltos o chirrido. (Punto negro --- 0,5)
② Tocar la banda 10 ó 14 de la disqueta de prueba (SZZP1014F), y comprobar si hay ruidos, saltos o chirrido. (Huellas dactilares)

3. REPLACEMENT AND ADJUSTMENT OF OPTICAL PICK-UP

3-1. Replacement of Optical Pick-Up

< Removing Method >

① Disassemble the player to take out the traverse unit as in Fig. 3-1. (Refer to the service manual.)

② Remove the spindle motor by unscrewing three fastening screws as shown in Fig. 3-2.

(Note)
Exercise care not to loose three nylon washers of the PCB fastening screws.

③ Remove the retainer A and B by unscrewing the fastening screws as shown in Fig. 3-3.

④ Unscrew the rack fastening screw as shown in Fig. 3-4.

(Note)
Exercise care not to loose a wave washer.

⑤ Take out the guide shafts A and B in the direction of an arrow shown in Fig. 3-5. The optical pick-up is removable.

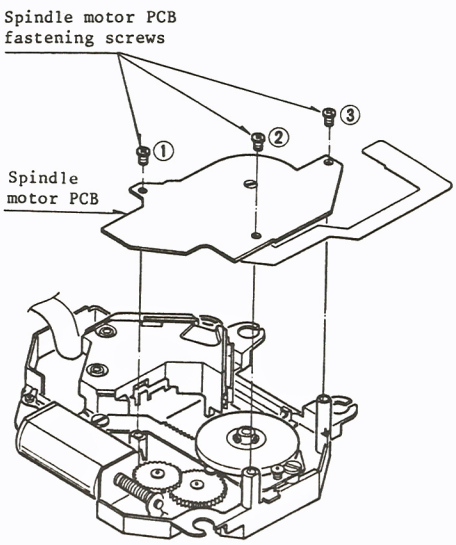


Fig. 3-2

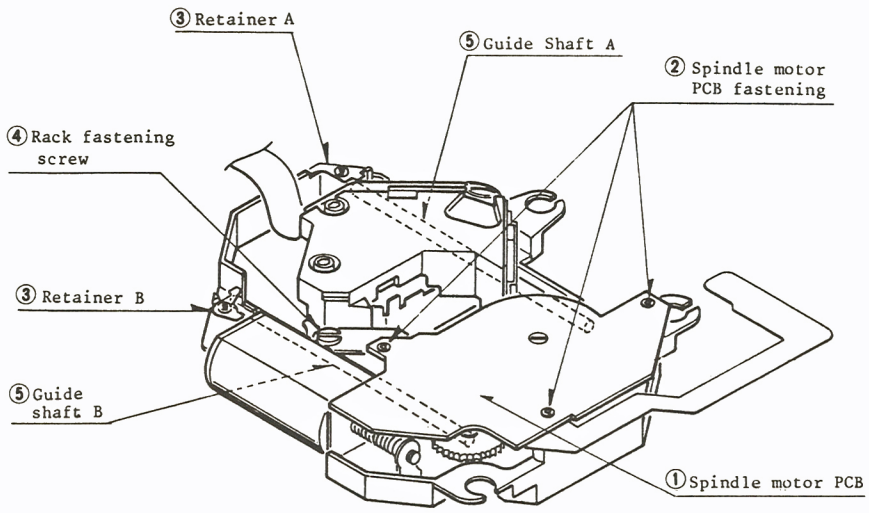


Fig. 3-1

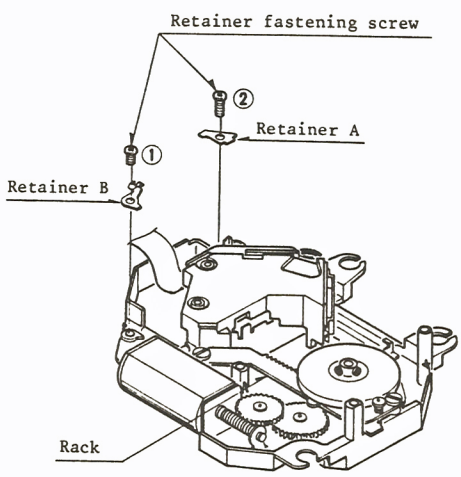


Fig. 3-3

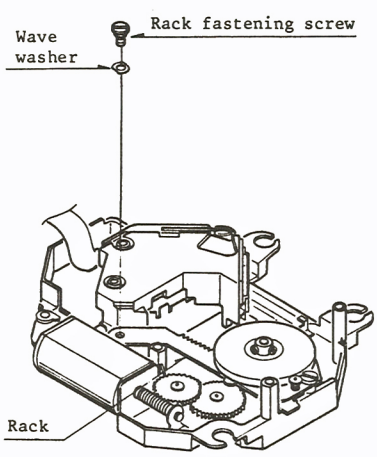


Fig. 3-4

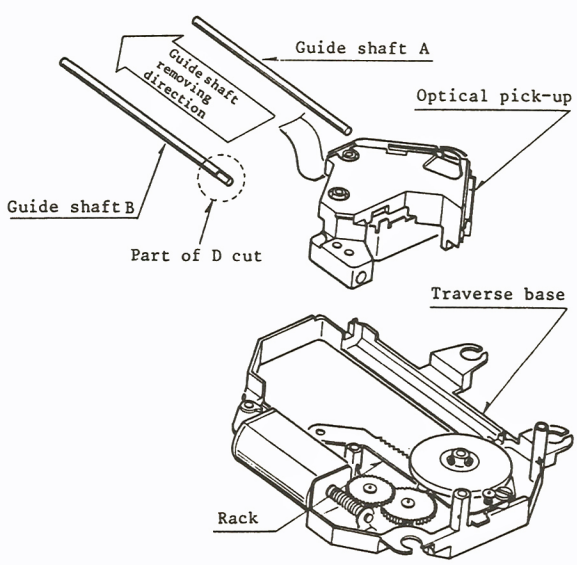


Fig. 3-5

< Installation Procedure >

Assemble the removed parts in the reversed order of the disassembling steps, by paying attention to the following points.

① Must install the guide shifts to the an arrow in Fig. 3-6, and install them to the traverse base.

(Note)
If the guide shifts are installed in the reversed direction, the leaf spring in the optical pick-up may be bent.
The guide shafts A and B are not identical. Install them carefully without confusing them.

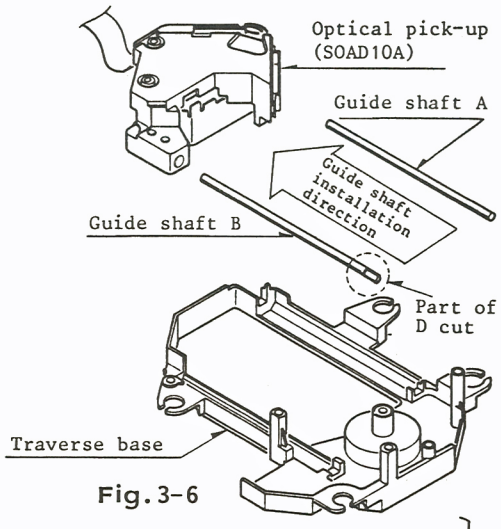


Fig. 3-6

(Hinweis)
Wenn die Führungsstäbe verkehrt herum eingesetzt werden, kann die Blattfeder im optischen Abnehmer verbogen werden.
Die Führungsstäbe A und B sind nicht identisch. Vorsichtig einsetzen und nicht vertauschen.

(Nota)
Si les axes de guidage sont installés dans la direction inverse, le ressort à lames dans la tête de lecture optique risquera d'être courbé ou déformé.
Les axes de guidage A et B ne sont pas identiques. Les installer avec soin en prenant garde de ne pas les confondre.

(Nota)
Si se instalan los cambios de guía en la dirección contraria, el resorte de hoja del captador óptico se puede doblar.
Los cambios de guía A y B no son idénticos. Instalarlos con cuidado sin confundirlos.

② Ensure that the D cut of the guide shaft B is installed as illustrated in Fig. 3-7.

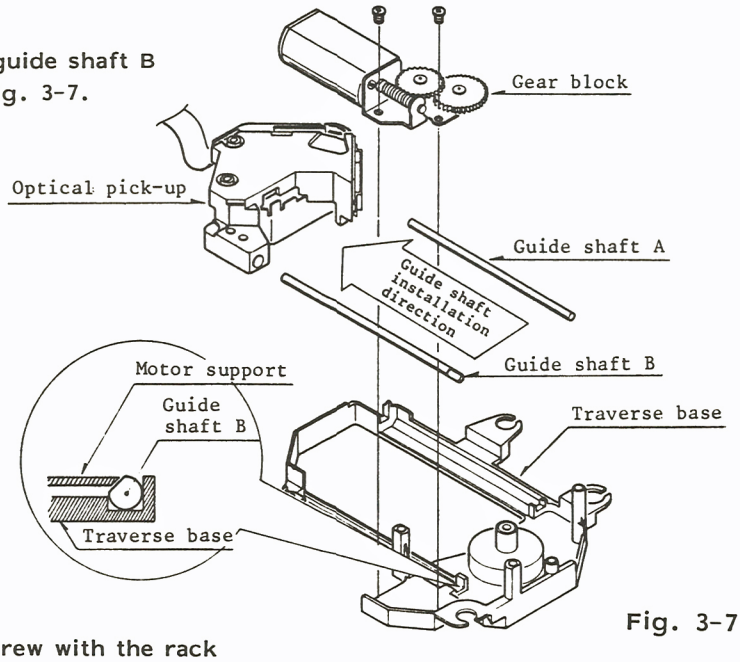


Fig. 3-7

③ Tighten the rack fastening screw with the rack in correct position as shown in Fig. 3-8.

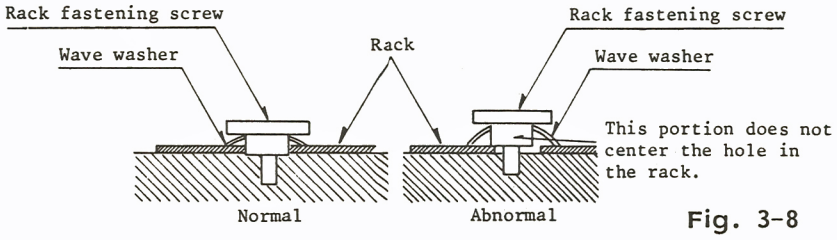


Fig. 3-8

3-2. Adjustment after Replacement of Optical Pick-Up

Preparation for Adjustment and Adjusting Points

On completion of replacing the optical pick-up, set up the player so that power-on check can be conducted.
(Set up as shown in Fig. 1-12)

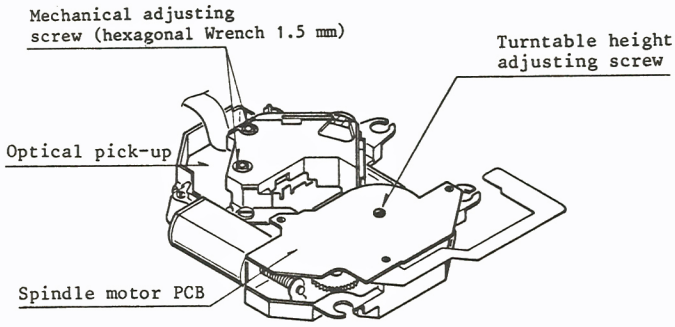


Fig. 3-9

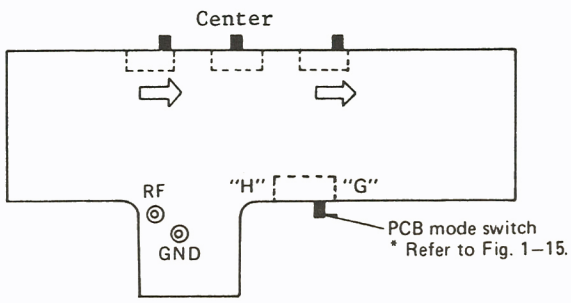


Fig. 3-10

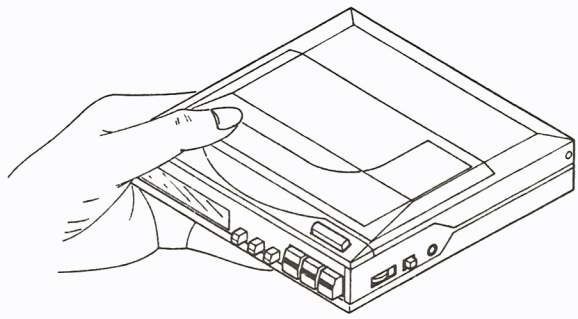


Fig. 3-11

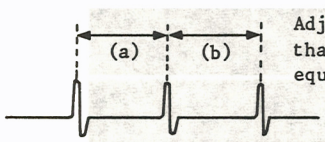


Fig. 3-12

A. Turntable Height Adjustment

① Position the switches of the PCB connection cord as shown in Fig. 3-10.
② Connect the oscilloscope to the terminals RF and GND of the PCB connection cord.

Oscilloscope Setting
- VOLT 200mV
- SWEEP..... 50msec.
- Input selector ..... A.C

③ Hold the set by the hand with the top face up as illustrated in Fig. 3-11.
④ Place the test disc (SZZP1014F) and turn on the power supply switch.
⑤ Be sure that the waveform shown in Fig. 3-12 is displayed on the oscilloscope.
⑥ If not, adjust the turntable height adjusting screw shown in Fig. 3-9 so that the waveform shall be as illustrated in Fig. 3-12.
(Handle the turntable height adjusting screw the care because the screw is plastic.)
⑦ After adjust, add the lock screw glue "like a nail paint" in turntable height adjusting screw on spindle PCB.
⑧ Turn off the power supply switch.

A. Einstellung der Drehtellerhöhe

① Die Schalter des Schaltplatten-Verbindungskabels wie in Abb. 3-10 einstellen.
② Das Oszilloskop an die Klemmen RF und GND des Schaltplatten-Verbindungskabels anschließen.

Einstellung des Oszilloskops
- SPANNUNG 200mV
- ABLENKUNG..... 50msec.
- Eingangsumschalter.W. ..... Wechselstrom

③ Wie in Abb. 3-11 das Gerät mit der Oberseite nach oben in der Hand halten.
④ Den Testdisk (SZZP1014F) einlegen und den Netzschalter auf "EIN" stellen.
⑤ Darauf achten, daß die auf dem Oszilloskop dargestellte Signalform wie in Abb. 3-12 aussieht.
⑥ Falls sie davon abweicht, wie in Abb. 3-9 die Justierschraube für die Drehtellerhöhe einstellen.
(Die Justierschraube vorsichtig handhaben, da sie aus Plastik ist.)
⑦ Nach erfolgter Einstellung die Justierschraube zur Einstellung der Drehtellerhöhe auf der Antriebsschaltplatte mit nagellackähnlichem Kleber arretieren.
⑧ Netzschalter auf "AUS" stellen.

A. Réglage de la hauteur de la platine

① Positionner les commutateurs du câble de raccordement de la plaquette à circuits imprimés, comme il est montré à la Fig. 3-10.
② Raccorder l'oscilloscope aux bornes RF (haute fréquence) et GND (terre) du câble de reccordement de la plaquette à circuits imprimés.

Réglages de l'oscilloscope
- TENSION ..... 200 mV
- BALAYAGE ..... 50 msec.
- Sélecteur d'entrée ..... C.A.

③ Tenir l'appareil à la main avec la face supérieure vers le haut, comme il est montré à la Fig.3-11.
④ Installer le disque d'essai (SZZP1014F) et mettre en marche l'interrupteur d'alimentation en courant.
⑤ S'assurer que la forme d'onde montrée à la Fig. 3-12 soit affichée sur l'oscilloscope.
⑥ Dans la négative, régler la vis d'ajustage de la hauteur de la platine comme il est montré à la Fig. 3-9, de telle sorte que la forme d'onde soit telle que celle illustrée à la Fig. 3-12. (Manipuler la vis de réglage de la hauteur de la platine avec précaution car elle est en plastique.)
⑦ Après le réglage, bloquer la vis de réglage de hauteur de la platine avec un produit tel qu'un "vernis à ongles" sur la plaquette à circuits imprimés de l'axe.
⑧

A. Ajuste de la altura del plato giratorio

① Poner los interruptores de la TCI del cable de sonexión como se muestra en la Fig. 3-10.
② Conectar el osciloscopio a los terminales RF y TIERRA de la TCI del cable de conexión.

Fijación del osciloscopio
- VOLTAJE 200mV
- BARRIDO ..... 50mseg.
- Selector de potencia de entrada ... CA

③ Aguantar el aparato con la mano con la cara superior hacia arriba como muestra la Fig. 3-11.
④ Poner la disqueta de prueba (SZZP1014F) y encender el interruptor de fuente de energía.
⑤ Confirmar que la forma de onda que se muestra en la Fig. 3-12 es la que se ve en el osciloscopio.
⑥ Si no se viera, ajustar con el tornillo de ajuste la altura del plato giratorio en la Fig. 3-9 de manera que la forma de onda sea como en la Fig. 3-12.
⑦ Después de realizar el ajuste, pintar el tornillo de ajuste de altura del plato giratorio con fijador semejante a "la laca de uñas" en la TCI del motor de vástago.
⑧ Apagar el interruptor de fuente de energía.

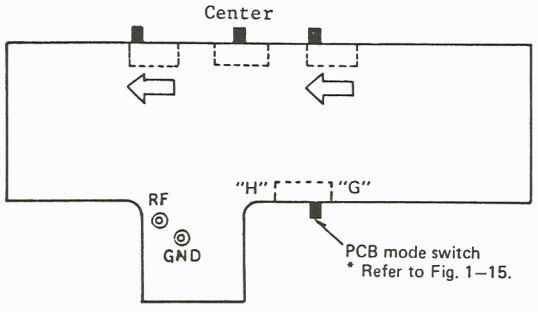


Fig. 3-13

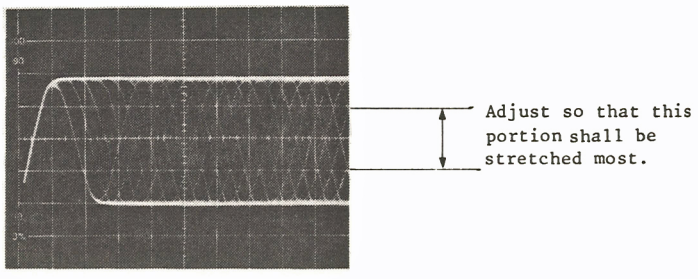


Fig. 3-14

B. Mechanical Adjustment

① Position the switches of the PCB connection cord as illustrated in Fig. 3-13.
② Connect the oscilloscope to the terminals RF and GND of the PCB connection cord.

Oscilloscope setting
- VOLT 200mV
- SWEEP ..... 0.5 sec.
- Input selector ..... A.C

③ Turn on the power supply switch.
④ Place the test disc (SZZP1014F) and set the player to the playing condition.
⑤ The RF signal will be displayed on the oscilloscope. Adjust the two mechanical adjusting screws so that the eye pattern is stretched most as shown in Fig. 3-14.

(Note)
Must conduct electrical adjustment on completion of replacing and adjusting the optical pick-up.

B. Mechanische Einstellung

① Die Schalter des Schalttafel-Verbindungskabels wie in Abb. 3-13 stellen.
② Das Oszilloskop an die Klemmen RF und GND des Schaltplatten-Verbindungskabels anschließen.

Einstellung des Oszilloskops
- SPANNUNG 200mV
- ABLENKUNG..... 0,5s
- Eingangsumschalter ..... Wechselstrom

③ Den Netzschalter auf "EIN" stellen.
④ Den Testdisk (SZZP1014F) einlegen und das Gerät auf Wiedergabe schalten.
⑤ Die zwei Justierschrauben zur mechanischen Einstellung so drehen, daß das Augenmuster des RF-Signals auf dem Oszilloskop so gedehnt wie möglich erscheint. (s. Abb. 3-14)

(Hinweis)
Die elektrische Einstellungs muß nach dem Auswechseln und Einstellen des optischen Abnehmers erfolgen.

B. Réglage mécanique

① Positionner les commutateurs du câble de raccordement de la plaquette à circuits imprimés comme il est illustré à la Fig. 3-13.
② Raccorder l'oscilloscope aux bornes RF (haute fréquence) et GND (terre) du câble de raccordement de la plaquette à circuits imprimés.

Réglages de l'oscilloscope
- TENSION ..... 200 mV
- BALAYAGE ..... 0,5 sec.
- Sélecteur d'entrée ..... C.A.

③ Mettre en marche l'interrupteur d'alimentation en courant.
④ Placer le disque d'essai (SZZP1014F) et régler l'appareil sur une condition d'audition.
⑤ Le signal de haute fréquence sera affiché sur l'oscilloscope. Régler les deux vis d'ajustement mécanique, de telle sorte que l'oscillogramme visuel soit étiré au maximum, comme il est montré à la Fig. 3-14.

(Nota)
Un réglage électrique devra être effectué à l'achèvement du remplacement et du réglage de la tête de lecture optique.

B. Ajuste mecánico

① Poner los interruptores de la TCI del cable de conexión como se ve en la Fig. 3-13.
② Conectar el osciloscopio a los terminales RF y TIERRA de la TCI del cable de conexión.

Fijación del osciloscopio
- VOLTAJE 200mV
- BARRIDO ..... 0,5 seg.
- Selector de potencia de entrada ... CA

③ Enchufar el interruptor de la fuente de energía.
④ Poner la disqueta de prueba (SZZP1014F) y poner el tocadiscos en condición de audición.
⑤ En el osciloscopio aparecerá la señal RF. Ajustar los dos tornillos de ajuste mecánico de forma que el módulo ocular se alargue el máximo como se ve la Fig. 3-4.

(Nota)
Se tiene que hacer un ajuste mecánico al acabar el cambio del captador óptico.

— MEMO —

4. REPLACEMENT PROCEDURE FOR CHIP COMPONENTS
4. VORGEHEN BEIM AUSWECHSELN VON CHIPS
4. PROCEDURE DE REMPLACEMENT POUR LES ELEMENTS DES MICROPLAQUETTES
4. PROCEDIMIENTO DE RECAMBIO PARA COMPONENTES DE PASTILLA

4-1. Replacing chip Components

CAUTION:

All chip components should be connected and disconnected, using a tapered soldering iron [temperature of the iron tip: less than 280°C ∿ 300°C (536°F ∿ 572°F)] a pair of tweezers and braided wire.

4-1. Auswechseln von Chips

VORSICHT:

Alle Chips sollten mit einem spitzen Lötkolben (Temperatur an der Spitze des Lötkolbens: weniger als 280°C ∿ 300°C), einer Pinzette und umsponenem Draht abgenommen und angeschlossen werden.

4-1. Remplacement des éléments des microplaquettes

ATTENTION:

Tous les éléments des microplaquettes devront être connectés ou déconnectés en utilisant un fer à souder de forme conique [température à l'extrémité du fer: inférieure à 280°C ∿ 300°C (536°F ∿ 572°F)], une paire de brucelles et des fils tressés.

4-1. Recambio de componentes de pastilla

CUIDADO:

Todos los componentes de pastilla (chip) se tienen que desarmar y montar unsado un soldador terrajado [temperatura de la punta del soldador: menos de 280°C ∿ 300°C (536°F ∿ 572°F)] unas pinzas de resorte y cable trenzado.

4-2. Precaution for Replacement

1. Do not disconnect the chip component forcefully. Otherwise, the Pattern (Foil) may Peel off.
2. Never re-use a disconnected chip component. Dispose off old chip components.
3. To protect the chip component, heating time for attaching the component should be within 3 seconds.
4. Use a magnifier etc. as far as practicable for repairing SL-XP7 or other model, because parts are highly densely mounted to make the unit or parts very compact, for eliminating secondary defect by soldering etc.

4-2. Vorsichtsmaßnahmen beim Auswechseln

1. Den Chip nicht gewaltsam abnehmen, sonst könnte sich das Schaltmuster (Folie) ablösen.
2. Abgenommene Chips auf keinen Fall wieder benützen, sondern wegwerfen.
3. Beim Anschließen nicht länger als 3 Sekunden erhitzen, damit der Chip nicht beschädigt wird.
4. Beim Reparieren des SL-XP7 oder anderer Modelle ist es geraten, eine Lupe o.ä. zu verwenden, weil die Teile sehr eng beieinander liegen und zufällig beschädigt werden könnten.

4-2. Précautions pour le remplacement

1. Ne pas déconnecter l'élément de la microplaquette avec force, sinon le motif (armature) risquera de se détacher.
2. Ne jamais réutiliser un élément de microplaquette déconnecté. Jeter les éléments de microplaquettes usagés.
3. Pour protéger l'élément de la microplaquette,la durée de chauffage pour fixer l'élément devra être de moins de 3 secondes.
4. Utiliser une loupe, etc., dans la mesure où c'est faisable, pour réparer le SL-X27 ou rout autre modèla, car les pièces sont montées de façon très rapprochée lors de la fabrication de l'appareil ou bien les éléments sont très compacts pour éliminer les défauts secondaires provoqués par le soudage, etc.

4-2. Cuidados que se tendrán al recambiar

1. No desconectara la fuerza la pastilla, porque se podría dañar el bastidor (hoja).
2. No usar nunca de nuevo una pastilla que se ha desmontado. Echar las que se hayan usado.
3. Para proteger el componente de pastilla, el tiempo de calentamiento para el montaje debe ser de menos de 3 segundos.
4. Usar una lupa, etc., según sea conveniente para la reparación de SL-XP7 u otros modelos, porque las piezas están montadas con densidad para conseguir que la unidad sea compacta, evitar malos efectos al realizar las soldaduras, etc.

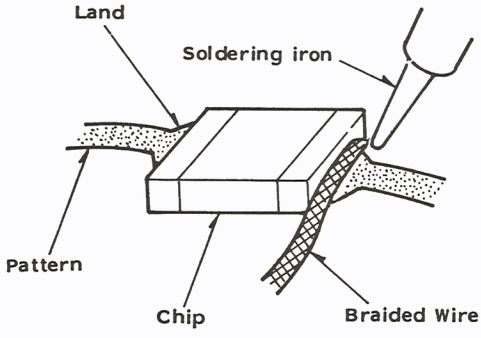


Fig. 4-1

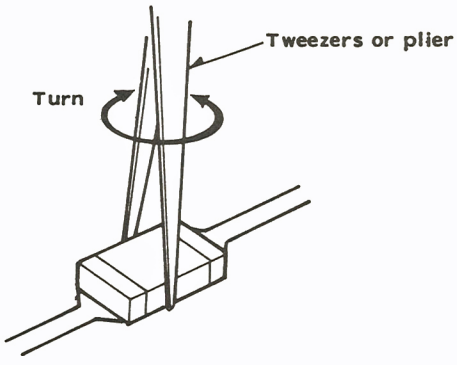


Fig. 4-2

4-3. Removing TR. C/R Diode Chip Components

1. Removing solder at electrode.
   - Remove the solder at the electrode, using a thin braided wire.
   - Do not remove the solder of the part (chip component) attached adjacent to the electrode.
2. Disconnecting chip components.
   - Turn the tweezers or plier with the soldering iron alternately applied to both electrodes, (However those chips a plaster to PCB during production) and the chip component will be disconnect.
   - Take careful precautions while disconnecting, because if the chip component is forcefully removed, the land (Foil) may Peel off.
3. Smoothing the soldered surface.
   - After disconnecting the chip component, remove the solder by using a braided wire to smooth the land (Foil) surface.

4-3. Abnehmen von Transistor Kondensator/Widerstände

1. Lötmasse an der Elektrode entfernen.
   - Lötmasse an der Elektrode mit dünnem umsponnenen Draht entfernen.
   - Darauf achten, daß die Lötmasse der Elektrode daneben nicht entfernt wird.
2. Abnehmen von Chips
   - Die Pinzette oder Zange drehen, während beide Elektroden abwechselnd mit dem Lötkolben berührt werden, dann kann der Chip abgenommen werden.
   - Beim Abnehmen sehr vorsichtig vorgehen, sonst könnte sich der Steg (Folie) ablösen.
3. Lötfläche glätten.
   - Nach dem Entfernen des Chips die Lötmasse mit umsponnenem Draht entfernen, damit die Stegoberfläche (Folie) glatt wird.

4-3. Enlèvement des éléments de la microplaquette de la diode à condensateur/résistance du transistor

1. Enlèvement de la soudure à l'électrode
   - Retirer la soudure se trouvant sur l'électrode en utilisant un fil tressé mince.
   - Ne pas enlever la soudure de la pièce (élément de la microplaquette) fixée dans le voisinage de l'électrode.
2. Déconnexion des éléments de la microplaquette
   - Tourner les brucelles ou la pince avec le fer à souder appliqué alternativement à l'une et l'autre électrodes, (ces microplaquettes sont plâtrées à la plaquette à circuits imprimés pendant la fabrication) et l'élément de la microplaquette sera déconnecté.
   - Faire très attention en déconnectant car si l'élément de la microplaquette est enlevé avec force, le plat (armature) risque de se détacher ou d'être écaillé.
3. Polissage de la surface soudée
   - Après la déconnexion de l'élément de la microplaquette, éliminer la soudure en utilisant un fil tressé pour polir la surface du plat (armature).

4-3. Desarmado del transistor, condensador/resistor y diodos

1. Quitar la suldadura del electrodo.
   - Quitar la soldadura del electrodo usando un cable trenzado delgado.
   - No quitar la soldadura de la pieza (componentes de pastilla) que está junto al electrodo.
2. Desarmado de los componentes de pastilla
   - Hacer girar las pinzas o alicates con el soldador aplicándolos alternativamente a ambos electrodos, (estas pastillas se han encastado en la TCI durante la fabricación), y así se desconectará la pastilla.
   - Tener sumo cuidado al desconectar, porque se sacan las pastillas a la fuerza, el bastidor (hoja) se puede dañar.
3. Suavizar la superficie soldada
   - Después de desarmar el componente de pastilla, quitar la soldadura usando un cable trenzado para suavizar la superficie el saliente (hoja) del bastidor.

Fig. 4-3

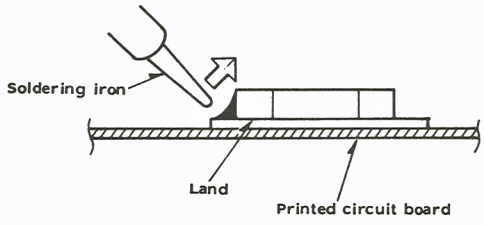


Fig. 4-4

4-4. Connecting TR. C/R Diode Chip Components

The value of chip components is not displayed on the main body except chip resistor. Take due precautions to avoid mixing new chip components with other ones.

1. Applying solder to land (foil) on one side.
   - Apply a thin layer of solder to the land on one side where the chip component is to be connected.
   - Too much solder may cause bridging.
2. Speedy soldering
   - Hold the chip component at the desired position, using tweezers, and apply the soldering iron in the arrow-marked direction.
   - To protect the chip component, heating time should be within 3 seconds.
3. Speedy soldering of electrode on the other side.
   - Solder the electrode on the other side in the same way as above in 2.

4-4. Raccordement des éléments de la microplaquette de la diode à condensateur/résistance du transistor

La valeur des éléments de la microplaquette n'est pas indiquée sur le corps principal, excepté pour la résistance de la microplaquette. On devra donc prendre garde afin d'éviter de mélanger les nouveaux éléments de la microplaquette avec d'autres.

1. Appliquer la soudure sur un coté du plat (armature)
   - Appliquer une mince couche de soudure sur un côté du plat, là où l'élément de la microplaquette doit être connecté.
   - Trop de soudure risquera de provoquer un pontage.
2. Soudage accéléré
   - Maintenir l'élément de la microplaquette à la position désirée, en utilisant des brucelles, et appliquer le fer à souder dans la direction indiquée par la flèche.
   - Pour protéger l'élément de la microplaquette, la durée de chauffage devra être en deçà de 3 secondes.
3. Soudage accéléré de l'électrode sur l'autre côté
   - Souder l'autre coté de l'électrode de la même manière qu'au paragraphe 2 ci-dessus.

4-4. Anschließen von Transistor Kondensator/Widerstände-Dioden-Chips

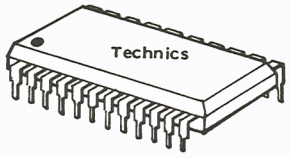
Die Werte von Chips sind nicht angeschrieben, außer von Chipwiderständen. Vorsicht ist geboten, daß neue Chips nicht mit alten verwechselt werden.

1. Auftragen von Lötmasse auf den Steg (Folie)
   - An einer Seite des Stegs, auf dem der Chip befestigt werden soll, eine dünne Schicht Lötmasse auftragen.
   - Zu viel Lötmasse kann Überbrückungen verursachen.
2. Zügiges Löten.
   - Mit einer Pinzette den Chip in die gewünschte Position bringen und mit dem Lötkolben in Pfeilrichtung arbeiten.
   - Das Erhitzen sollte weniger als 3 Sekunden dauern, damit der Chip nicht beschädigt wird.
3. Zügiges Löten der Elektrode auf der anderen Seite
   - Die Elektrode auf der anderen Seite wie in 2. löten.

4-4. Montaje del transistor, condensador/resistor y diodos

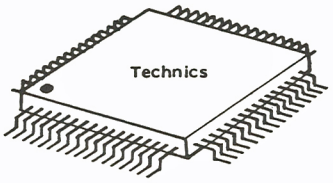
El valor de los componentes de pastilla no se muestra en el cuerpo principal a excepción de la pastilla de resistencia. Tener el suficiente cuidado para evitar la mezcla de las pastillas nuevas con otras.

1. Aplicar soldadura al bastidor (hoja) por un lado
   - Aplicar una capa fina de soldador por un lado del bastidor donde el componente de pastilla se tiene que conectar.
   - Demasiada soldadura puede causar un falso contacto.
2. Hacer la soldadura rápidamente
   - Mantener el componente de pastilla en la posisión deseada, usando las pinzas, y aplicar el soldador en la dirección que marca la flecha.
   - Para proteger el componente de pastilla, el tiempo de calentamiento debe ser de menos de 3 segundos.
3. Hacer la soldadura rápida del electrodo del otro lado
   - Soldar el electrodo del otro lado de la misma manera que en el número 2.



Type A

Fig. 4-5



Type B

Fig. 4-6

4-5. Removing Flat Package IC Chip Components

Note:
There are two type of IC chip components as shown below.

4-5. Enlèvement des éléments de la microplaquette à circuit intégré extra-plate

Nota:
Il existe deux types d'éléments de microplaquettes à circuits intégrés, comme il est montré ci-dessus.

4-5. Abnehmen von ICPaket-Chips

Hinweis:
Es gibt zwei Typen von Chips (s. unten).

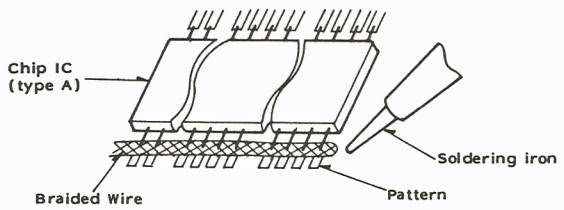


Fig. 4-7

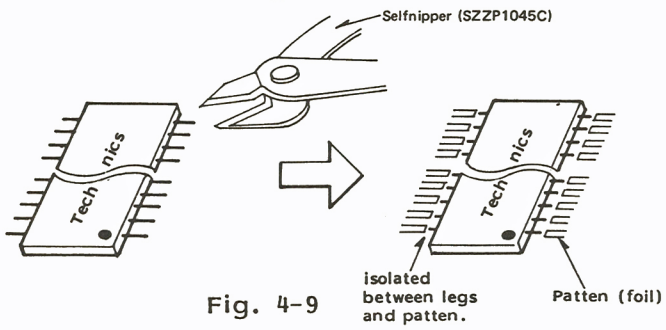


Fig. 4-9

4-5. Desarmado de los componentes de pastilla de paquete plano de CI

Nota:
Hay dos tipos de componentes de pastilla para CI como muestra la siguiente figura.

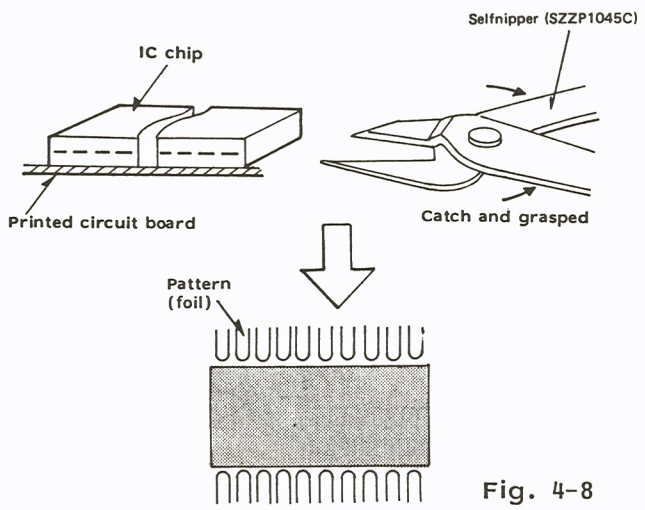


Fig. 4-8

A. Removing Flat Package IC chip component (Type A)

1. Removing solder at IC legs
   - Remove the solder at the both side of IC legs, using a thin braided wire.
   - Do not remove the solder of the part (chip component) attached adjacent to the electrode.
2. Disconnecting chip component.
   - Cut the both side of IC legs by Selfnipper. (SZZP1045C).
   - Catch the IC chip by Selfnipper as shown below, and grasped, then a chip component will be disconnected.
   - Take careful Precautions while disconnecting, because the chip will be scattering.
3. Smoothing the soldered surface.
   - After disconnecting the IC chip component, remove the solder by using a thin braided wire to smooth the land (foil) surface especially scraps iron of IC legs.

A. Abnehmen von ICPaket-Chips (Typ A)

1. Entfernen der Lötmasse an den Kontakten.
   - Die Lötmasse an den Kontakten beider Seiten mit einem feinen unsponnenen Draht entfernen. Darauf achten, daß die Lötmasse an den Kontakten des benachbarten Chips nicht entfernt wird.
2. Den Chip abnehmen.
   - Die Kontakte auf beiden Seiten mit der Zange (SZZP1045C) abzwicken.
   - Wie auf der Abbildung unten den Chip mit der Zange nehmen und abnehmen.
   - Beim Abnehmen umsichtig vorgehen, sonst zerbricht der Chip.
3. Glätten der Lötfläche
   - Nach dem Abnehmen des Chips wird die Lötmasse mit einem dünnen umsponnenen Draht so entfernt, daß der Steg (Folie) glatt ist. Rauhe Oberfläche beschädigt vor allem das Metall der Kontakte.

A. Enlèvement de l'élément de la microplaquette à circuit intégré extra-plate (Type A)

1. Enlèvement de la soudure aux branches du circuit intégré
   - Retirer la soudure sur les deux côtés des branches du circuit intégré, en utilisant un fil tressé mince.
   - Ne pas retirer la soudure de la pièce (élément de la microplaquette) fixée dans le voisinage de l'électrode.
2. Déconnexion de l'élément de la microplaquette
   - Couper les deux côtés des branches du circuit intégré avec une pince coupante (SZZP1045C)
   - Retenir la microplaquette à circuit intégré avec la pince coupante, comme il est montŕe ci-dessous, et la saisir. Ainsi, l'élément de la microplaquette sera déconnecté.
   - Prendre garde, lors de la déconnexion, que la microplaquette ne se brise pas.
3. Polissage de la surface soudée.
   - Après la déconnexion de l'élément de la microplaquette à circuit intégré, enlever la soudure en utilisant un fil tressé mince pour polir la surface du plat (armature), particulièrement les petits déchets en fer des branches du circuit intégré.

A. Desarmado del componente de pastilla de paquete plano de CI (Tipo A)

1. Quitar la soldadura de las espigas del CI.
   - Quitar la soldadura de ambos lados de las espigas del CI usando un cable trenzado delgado. No quitar la soldadura de la parte (del componente de pastilla) que está junto al electrodo.
2. Desarmado de un componente de pastilla
   - Cortar las espigas del CI por ambas partes con una tenaza autoprensora (SZZP1045C)
   - Coger la pastilla del CI con una tenaza autoprensora como se muestra abajo, y apretar; así se desprenderá la pastilla.
   - Tener cuidado al desarmar la porque puede trocearse.
3. Suavizar la superficie soldada
   - Después de desarmar la pastilla de CI, quitar la soldadura usando un cable trenzado delgado para suavizar el saliente del bastidor (hoja). La superficie desigual daña los vástagos del CI.

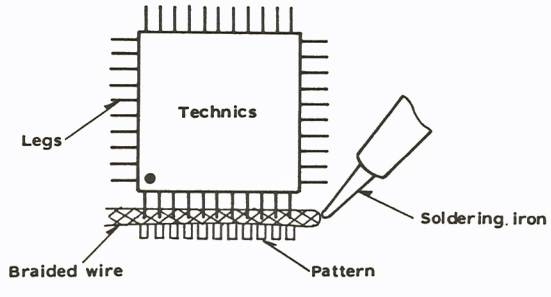
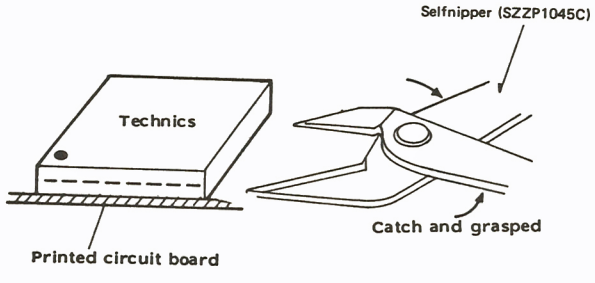


Fig. 4-10



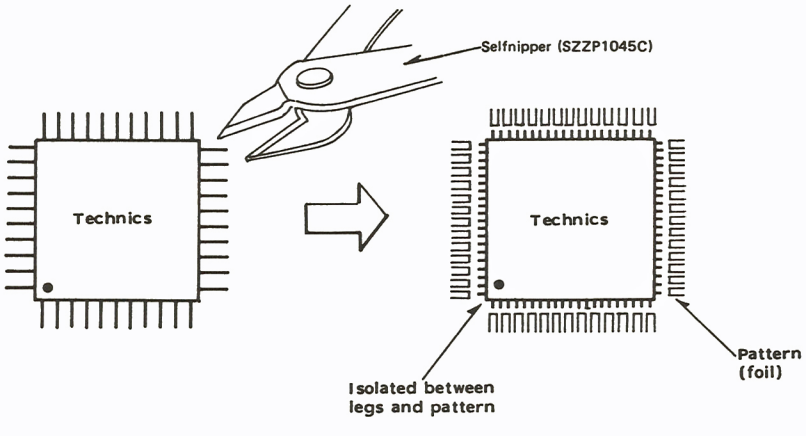


Fig. 4-11

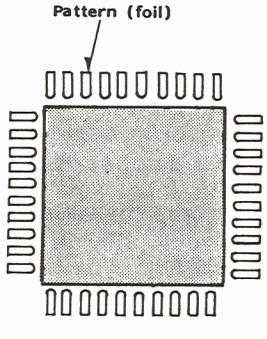


Fig. 4-12

B. Removing Flat Package IC chip component (Type B)

1. Removing solder at IC legs.
   - Remove the solder at the all legs of IC, using a thin braided wire.
   - Do not remove the solder of the part (chip component) attached adjacent to the electrode.
2. Disconnecting chip component.
   - Cut the all legs of IC by Selfnipper (SZZP1045C).
   - Catch the IC chip by Selfnipper as shown below, and grasped. The chip component will be disconnected.
   - Take careful Precautions while disconnecting, because the chip will be scattering.
3. Smoothing the solder surface.
   - After disconnecting the IC chip component, remove the solder by using thin braided wire to smooth the land (foil) surface especially scraps iron of IC legs.

B. Enlèvement de l'élément de la microplaquette à circuit intégré extra-plate (Type B)

1. Enlèvement de la soudure aux branches du circuit intégré
   - Retirer la soudure sur l'ensemble des branches du circuit intégré, en utilisant un fil tressé mince.
   - Ne pas retirer la soudure de la pièce (élément de la microplaquette) fixée dans le voisinage de l'électrode.
2. Déconnexion de l'élément de la microplaquette
   - Couper l'ensemble des branches du circuit intégré avec une pince coupante (SZZP1045C).
   - Retenir la microplaquette à circuit intégré avec la pince coupante, comme il est montré ci-dessus, et la saisir.
   - Prendre garde, lors de la déconnexion, que la microplaquette ne se brise pas.
3. Polissage de la surface soudée
   - Après la déconnexion de l'élément de la microplaquette à circuit intégré, retirer la soudure en utilisant un fil tressé mince pour polir la surface du plat (armature), particulièrement les petits déchets en fer des branches du circuit intégré.

B. Abnehmen von ICPaket-Chips (Typ B)

1. Lötmasse an den Kontakten entfernen
   - Mit einem dünnen umsponnenen Draht die Lötmasse an allen Kontakten des Chips entfernen.
   - Darauf achten, daß die Lötmasse an den Kontakten des benachbarten Chips nicht entfernt wird.
2. Abnehmen des Chips
   - Alle Kontakte des IC (Integrierten Schaltkreises) mit der Zange (SZZP1045C) abzwicken.
   - Den IC-Chip mit der Zange wie in der Abbildung unten fassen und abnehmen.
   - Beim Abnehmen behutsam vorgehen, sonst zerbricht der Chip.
3. Glätten der Lötfläche
   - Wenn der IC-Chip abgenommen ist, mit einem dünnen umsponnenen Draht den Steg (Folie) von Lötmasse reinigen. Rauhe Oberfläche beschädigt das Metall der Kontakte.

B. Desarmado del componente de pastilla del paquete plano de CI (Tipo B)

1. Quitar la soldadura de los vástagos del CI.
   - Quitar la soldadura de todos los vástagos del CI, usando un cable trenzado delgado.
   - No quitar la soldadura de la parte (del componente de pastilla) que está junto al electrodo.
2. Desarmado de un componente de pastilla
   - Cortar todos los vástagos del CI con una tenaza autoprensora (SZZP1045C)
   - Tomar la pastilla del CI con la tenaza autoprensora como muestra la figura, y sujetarla. El componente de pastilla se desprenderá.
   - Tener cuidado al desmontarla porque la pastilla se puede trocear.
3. Suavizar la superficie de soldadura
   - Después de desarmar el componente de pastilla del CI, quitar la soldadura usando un cable trenzado delgado para suavizar la superficie del saliente del bastidor (hoja) porque la soldadura sobrante daña los vástagos del CI.

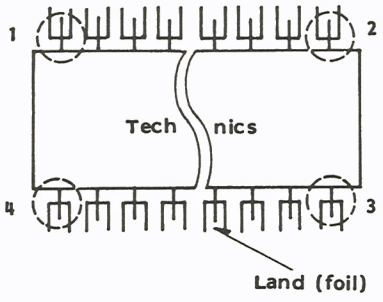


Fig. 4-13

4-6. Connecting Flat Package IC Chip Components (Type A, B)

- The part number of chip components is not displayed on PC board, except reference number.
- Take due precautions to avoid mixing new chip components with other ones.

1. Applying solder to land (foil) on four corners.
   - Apply a thin layer of solder to the land on four corners.
   - Set the chip component with correct position between land (foil) and IC legs, and soldering.
   - Where the chip component is to be connected.
   - Too much solder may cause bridging.
2. Speedy soldering
   - Apply the soldering iron with thin layer in the arrow-marked direction.
   - To protect the chip component, heating time should be within 3 seconds of each legs.
3. Speedy soldering of electrode on the other side.
   - Solder the electrode on the other side in the same way as above in 2.

4-6. Anschluß von ICPaket-Chips (Typ A und B)

- Auf der Schalttafel ist nicht die Seriennummer des Chips, sondern nur eine Bezugsnummer vermerkt.
- Darauf achten, daß alte Chips nicht mit neuen verwechselt werden.

1. An den vier Ecken Lötmasse auf den Steg (Folie) autragen.
   - An den vier Ecken auf den Steg eine dünne Schicht Lötmasse auftragen.
   - Den Chip auf die gewünschte Stelle zwischen Steg (Folie) und Kontakten setzen und festlöten.
   - Lage des Chips
   - Zu viel Lötmasse kann Überbrückung zur Folge haben.
2. Zügiges Löten.
   - Mit dem Lötkolben eine dünne Schicht in Pfeilrichtung auftragen.
   - Nicht länger als drei Sekunden erhitzen, damit der Chip nicht beschädigt wird.
3. Zügiges Löten der Elektroden auf der anderen Seite
   - Die Elektroden auf der anderen Seite wie oben in 2. löten.

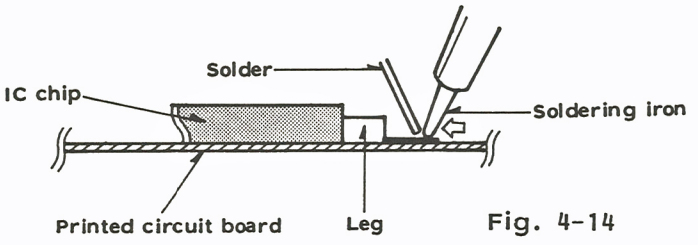


Fig. 4-14

4-6. Raccordement des éléments des microplaquettes à circuits intégrés extra-plates (Types A et B)

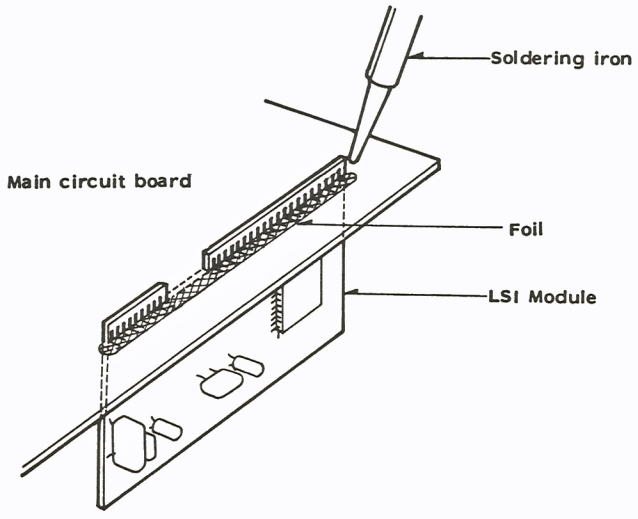
- Les numéros des pièces des éléments des microplaquettes ne sont pas indiqués sur la plaquette à circuits imprimés, sauf le numéro de référence.
- On devra prendre garde d'éviter de mélanger les nouveaux éléments de la microplaquette avec d'autres.

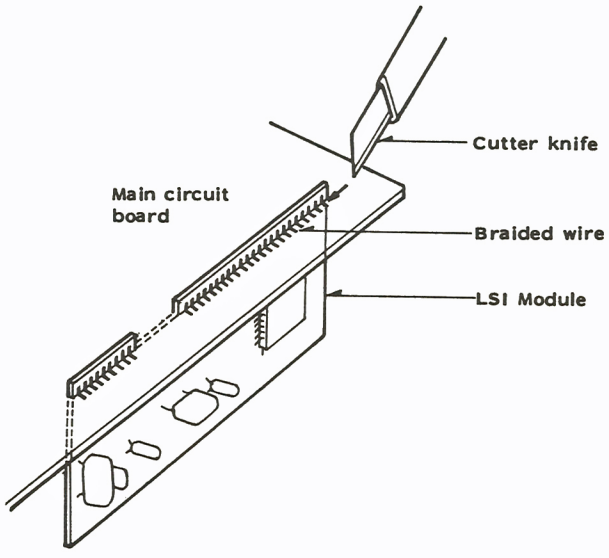
1. Appliquer de la soudure aux quatre coins du plat (armature)
   - Appliquer une mince couche de soudure aux quatre coins du plat.
   - Installer l'élément de la microplaquette dans un positionnement correct entre le plat (armature) et les branches du circuit intégré; puis, souder.
   - Souder à l'endroit où l'élément de la microplaquette doit être raccordé.
   - Trop de soudure risquera de provoquer un pontage.
2. Soudage accéléré
   - Appliquer une mince couche de soudure avec le fer à souder dans la direction indiquée par la flèche.
   - Pour protéger l'élément de la microplaquette, la durée de chauffage devra être inférieure à 3 secondes pour chaque branche.
3. Soudage accéléré de l'électrode sur l'autre côté
   - Souder l'autre coté de l'électrode de la même manière qu'au paragraphe 2 ci-dessus.

4-6. Arma los componentes de pastilla de CI de paquete plano (Tipos A y B)

- En la tablilla de circuítos impresos no se muestra el número de los componentes de pastilla a excepción del número de referencia.
- Tener cuidado de no mezclar las pastillas nuevas con las usadas.

1. Aplicar soldadura al saliente del bastidor (hoja)
   - Aplicar una capa fina de soldadura en los cuatro lados del saliente del bastidor.
   - Fijar el componente de pastilla en la correcta posición entre el saliente (hoja) y los vástagos del CI, y luego soldar.
   - Fijarse en el lugar donde la pastilla se tiene que conectar.
   - Demasiada soldadura puede causar contactos falsos.
2. Soldar rápidamente
   - Aplicar el soldador en una capa delgada en la dirección que indica la flecha.
   - Para proteger el componente de la pastilla, el tiempo de calentamiento debe ser menos de 3 segundos para cada espiga.
3. Soldar con rapidez el electrodo del otro lado
   - Soldar el electrodo del otro lado de la misma manera que en el párrafo 2.





4-7. Removing LSI Module (Digital Board)

1. Removing solder at electrode.
   - Remove the solder at the both side electrode, using a thin braided wire.
2. Disconnecting LSI Module.
   - Cut the both side of foil face on LSI Module by cutter knife as shown below.
   - Take careful precautions during this procedure, otherwise the foil pattern may cut off.
   - Remove the LSI Module from main circuit board.
   - Can exchanging individual components from LSI Module.

4-7. Enlèvement du module de l'intégration à grande échelle (Plaquette numérique)

1. Enlèvement de la soudure à l'électrode
   - Retirer la soudure se trouvant aux deux côtés de l'électrode, en utilisant un fil tressé mince.
2. Déconnexion du module de l'intégration à grande échelle
   - Couper les deux cotés de la face antérieure de l'armature sur le module de l'intégration à grande échelle avec une lame à découper, comme il est montré ci-dessous.
   - Prendre garde durant cette procédure de ne pas couper le motif de l'armature.
   - Retirer le module de l'intégration à grande échelle de la plaquette à circuits principale.
   - On peut permuter les éléments individuels provenant du module de l'intégration à grande échelle.

4-7. Abnehmen des LSI-Moduls (Digital-Schaltplatte)

1. Entfernen der Lötmasse an den Elektroden.
   - Mit einem dünnen umsponnenen Draht die Lötmasse von den Elektroden auf beiden Seiten entfernen.
2. Das LSI-Modul abnehmen.
   - Auf beiden Seiten des LSI-Moduls mit einem Messer abschneiden (s. Abbildung unten).
   - Behutsam vorgehen, damit die Schaltkreisfolie nicht durchgetrennt wird.
   - Das LSI-Modul von der Hauptschalttafel abnehmen.
   - Jetzt können einzelne Bestandteile des LSI-Moduls ersetzt werden.

4-7. Desarmado del módulo LSI (Integración en gran escala) (Tablilla digital)

1. Quitar la soldadura del electrodo
   - Quitar la soldadura del electrodo de ambos lados, usando un cable trenzado delgado.
2. Desarmado del módulo IGS.
   - Cortar por ambos lados la hoja de contacto de fase del módulo IGS con un cortador de cartulina, como se muestra en la figura.
   - Tener cuidado durante el procedimiento porque podría cortarse indebidamente la hoja del bastidor de contacto.
   - Quitar el módulo IGS del la tabalilla principal de circuítos.
   - Se pueden cambiar determinados componentes del módulo IGS.

4-8. Flexible Circuit Board Repairing

1. Keep the temperature of the soldering iron at 260°C ±10°C within 5 seconds during repairing.
2. Do not touch the soldering iron more than 5 seconds or 3 times on the same conductor of the circuit board.
3. Do not apply force on the conductor when soldering or unsoldering.

4-8. Réparation de la plaquette à circuits flexible

1. Maintenir la température du fer à souder à 260°C ± 10°C en deçà de 5 secondes pendant la réparation.
2. Ne pas toucher le fer à souder pendant plus de 5 secondes ou 3 fois sur le même conducteur de la plaquette du circuit.
3. Lors du soudage ou du dessoudage, ne pas appliquer le fer à souder avec force sur le conducteur.

4-8. Reparatur des FCB (Elastische Schalttafel)

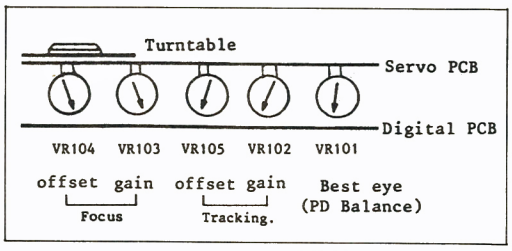
1. Temperatur des Lötkolbens sollte 260°C ± 10°C betragen und 5 Sekunden lang angelegt werden.
2. Den Lötkolben nicht länger als 5 Sekunden und nicht öfter als 3 Mal an die gleiche Stelle der Schalttafel halten.
3. Beim Löten nicht unnötig fest aufdrücken.

4-8. Reparación de la tablilla flexible de circuitos

1. Mantener la temperatura del soldador en 260°C ± 10°C a menos de 5 segundos durante la reparación.
2. No tocar con el soldador más de 5 segundos la tablilla de circuítos o el mismo conductor más de 3 veces.
3. No aplicar fuerza al conductor al soldar o desoldar.

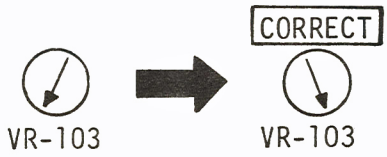
— MEMO —

(4) Initial setting points of adjusting variable resistors



- Adjusting variable resistors

The player operates but not optimum at the above settings of the adjusting variable resistors. Adjust them according to the adjusting procedure. Must conduct the electrical adjustment when any electrical part is replaced. Perform 1 optical pick-up adjustment and 2 electric adjustment in the stated order when the optical pick-up is replaced.



- Einstellung der Regelwiderstände

Das Gerät funktioniert bei der oben dargestellten Einstellung der Regelwiderstände, aber nicht optimal. Gemäß dem Einstellvorgang einstellen. Die elektrische Einstellung muß immer vorgenommen werden, wenn ein Teil ausgetauscht wird. Nach dem Auswechseln des optischen Abnehmers ① Einstellung des optischen Abnehmers und ② die elektrische Einstellung in dieser Reihenfolge vornehmen.

- Réglage des résistances variables

L'appareil fonctionne, mais non dans les conditions optima des réglages précédents des résistances variables d'ajustement. Les régler selon la procédure d'ajustement. On devra réaliser un réglage électrique lorsque n'importe quel élément électrique est remplacé. Effectuer ① réglage de la tête de lecture optique et ② le réglage électrique dans l'ordre indiqué lorsqu'on remplace la tête de lecture optique.

- Ajuste de las resistencias variables

Si tocadiscos opera de forma anormal con dichos ajustes de los resistores variables, ajustarlos según el procedimiento de ajuste. Se hará el ajuste eleéctrico cuando se cambie cualquier pieza eléctrica. Ajustar el captador óptico y dos ajustes eléctricos en dicho orden cuando se cambie el captador óptico.

3-2. Adjustment after Replacement of Optical Pick-Up

Preparation for Adjustment and Adjusting Points

On completion of replacing the optical pick-up, set up the player so that power-on check can be conducted.
(Set up as shown in Fig. 1-12)

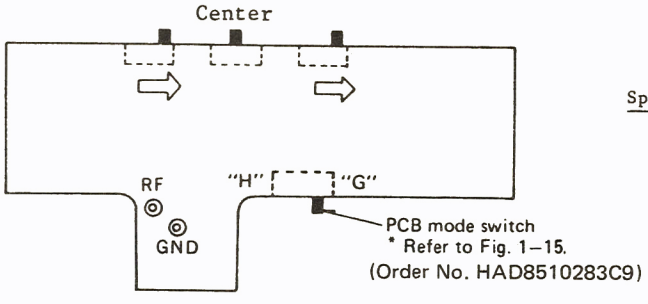


Fig. 3-10

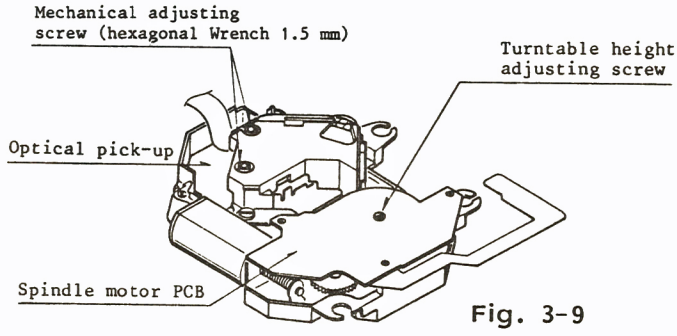


Fig. 3-9

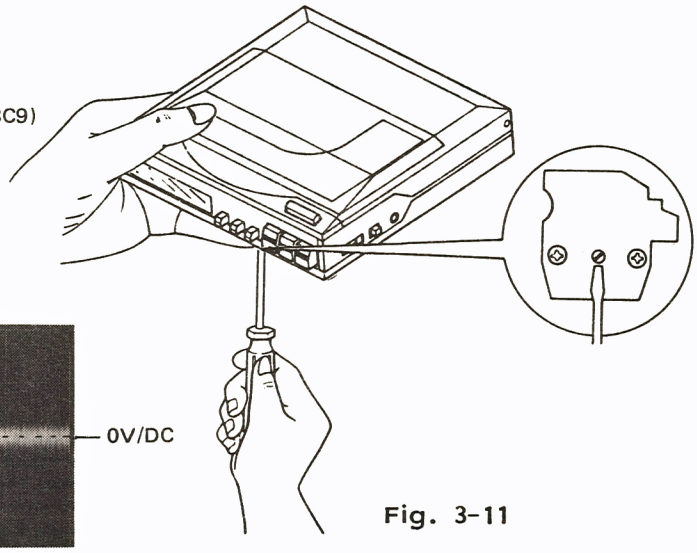


Fig. 3-11

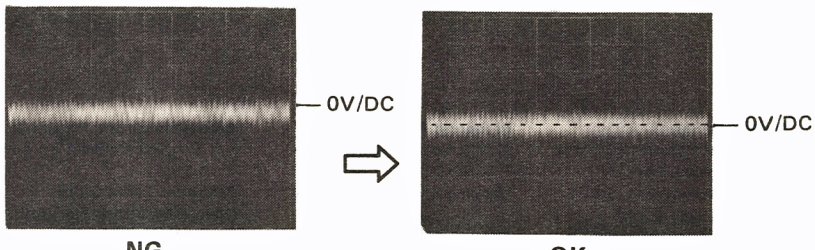


Fig. 3-12

ENGLISH

A. Turntable Height Adjustment

① Position the switches of the PCB connection cord as shown in Fig. 3-10.
② Set the oscilloscope to DC zero balance.
③ Connect the oscilloscope to the terminals FEG and GND of the PCB connection cord.

Oscilloscope Setting
VOLT ..... 100 mV
SWEEP ..... 5 msec.
Input selector ..... DC

④ Place the test disc (SZZP1014F) to the disc holder.
⑤ Hold the set by the hand with the top face up as illustrated in Fig. 3-11.
⑥ Turn on the power supply switch of the player to the playing status.
⑦ Be sure that the Waveform shown in Fig. 3-12 "OK" is displayed on the oscilloscope.
⑧ If not, adjust the turntable height adjusting screw shown in Fig. 3-9, so that the waveform shall be 0 ± 50mV/DC as shown in Fig. 3-12 "OK". (Handle the turntable height adjusting screw the care because the screw is plastic.)
⑨ If mechanical noise is present, please readjusting again.
⑩ Turn off the power supply switch.
⑪ After adjust, add the lock screw glue "like a nail paint" in turntable height adjusting screw on spindle PCB.

DEUTSCH

A. Einstellung der Drehtellerhöhe

① Die Schalter des Schaltplattenverbindungskabels wie in Abb. 3-10 einstellen.
② Das Oszilloskop auf OV-Gleichstrom-Balance einstellen.
③ Das Oszilloskop an die Klemmen FEG und GND des Schaltplattenverbindungskabels anschließen.

Einstellung des Oszilloskops
Spannung 100mV
Ablenkung ..... 50msec.
Eingangsumschalter ..... Gleichstrom

④ Den Testdisk (SZZP1014F) einlegen.
⑤ Wie in Abb. 3-11 das Gerät mit der Oberseite nach oben in der Hand halten.
⑥ Den Netzschalter des Stromzufuhr zum Geräts auf "EIN" stellen.
⑦ Darauf achten, da die auf dem Oszilloskop dargestellte Signalform wie in Abb. 3-12 "in Ordnung" aussieht.
⑧ Falls sie davon abweicht, wie in Abb. 3-9 die Einstellschraube fur die Drehtellerhöhe einstellen, bis die Signalform wie in Abb. 3-12 "in Ordnung" 0 ± 50mV/Gleichstrom darstellt. (Die Einstellschraube für die Drehtellerhöhe vorsichtig handhaben, da sie aus Plastik ist.
⑨ Falls ein mechanisch erzeugtes Geräusch auftritt, muß die Einstellung noch einmal vorgenommen werden.
⑩ Netzschalter auf "AUS" stellen.
⑪ Nach erfolgter Einstellung die Justierschraube für die Drehtellerhöhe mit nagellackähnlichem Kleber auf der Wellenschalttafel arretieren.

FRANÇAIS

A. Réglage de la hauteur de la platine

① Positionner les commutateurs de câble de raccordement de la plaquette à circuits imprimés comme il est montré à la Fig. 3-10.
② Régler l'oscilloscope sur un équilibrage de zéro C.C.
③ Raccorder l'oscilloscope aux bornes FEG et GND du câble de raccordement de la plaquette à circuits imprimés.

Réglage de l'oscilloscope
TENSION ..... 100 mV
BALAYAGE ..... 5 msec.
Sélecteur d'entrée ..... C.C.

④ Installer le disque d'essai (SZZP1014F) dans le dispositif du support de disque.
⑤ Tenir l'appareil avec la main avec la face supérieure vers le haut, comme il est montré à la Fig. 3-11.
⑥ Mettre en marche l'interrupteur d'alimentation en courant de l'appareil sur une condition d'audition.
⑦ S'assurer que la forme d'onde montrée à la Fig. 3-12 "OK" soit affichée sur l'oscilloscope.
⑧ Dans la négative, régler la vis d'ajustage de la hauteur de la platine comme il est montré à la Fig. 3-9, de telle sorte que la forme d'onde soit de 0 ± 50 mV/C.C., comme il est montré à la Fig. 3-12 "OK".
(Manipuler la vis d'ajustage de la hauteur de la platine avec précaution car elle est en plastique.)
⑨ Si un bruit mécanique se produit, veuillez régler à nouveau.
⑩ Mettre hors circuit l'interrupteur d'alimentation en courant.
⑪ Après la mise au point, bloquer la vis de réglage de la hauteur de la platine avec un produit tel qu'un "vernis à ongles" sur la plaquette à circuits imprimés de l'axe.

ESPAÑOL

A. Ajuste de la altura del plato giratorio

① Poner los interruptores de la tablilla de circuítos impresos como se ve en la Fig. 3-30.
② Poner el osciloscopio en el balance de cero de CD.
③ Conectar el osciloscopio a los terminales FEG y de TIERRA de la tablilla de circuítos impresos del cable de conexión.

Fijación del osciloscopio
VOLTAJE 100mV
BARRIDO .....50mseg.
Selector de potencia de entrada ...CA

④ Poner la disqueta de prueba (SZZP1014F) en su soporte.
⑤ Tomar la unidad con la mano con la cara superior hacia arriba como muestra la Fig. 3-11.
⑥ Encender el interruptor de la fuente de energía del tocadiscos, en la estado de audición.
⑦ Asegurarse de que la forma de onda de la Fig. 3-12 "OK", se muestra en osciloscopio.
⑧ De lo contrario, hacer un ajuste con el tornillo de altura del plato giratorio, que se muestra en la Fig. 3-9, para que la formma de onda sea 0 ± 50mV/CD, como se muestra en la Fig. 3-12 "OK".
(Tratar con cuidado el tornillo de ajuste del plato giratorio, porque está hecho de plástico)
⑨ Si se nota ruído mecánico, hacer el ajuste de nuevo.
⑩ Desconectar el interruptor la fuente de energía.
⑪ Después del ajuste, poner goma de seguridad "semejante a laca de uñas" en el tornillo de ajuste de la altura del plato giratorio de la tablilla de impresos del motor de vástago.

ORDER NO. HAD8601334T0
A6

Technical Information

CAUTIONS AND ADVICE ON CLEANING FOCUS LENS

The focus lens is frequently touched at mounting and dismounting a disc especially on portable CD players.
Clean the soiled surface of the lens with the specified cleaning kit **(kit number SZZP1038C)** before or after servicing.

Symptoms

The following symptoms may be caused not only by faulty software or hardware but also by the soiled focus lens.

- **Not reading TOC**
- **Not playback**
- **Skipping sound**

Applicable models

SL-XP7 and other portable CD player

(Note) Clean the focus lens of the regular type CD player as well in the steps outlined below when the CD player are serviced.

Cause

Soiling of the focus lens suefaces with dirt, dust, finger print, and others.

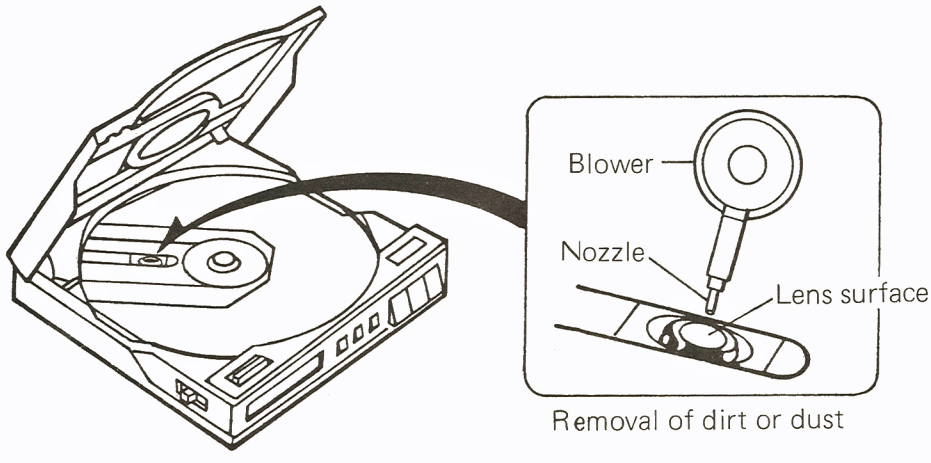
(Note) Clean the lens in the following steps even if it looks to be clean because soiling is not always discernible visually.

Cleaning steps

(1). Clean the surface of the disc.

(2). Removing method of dirt, dust, or etc, from the focus lens.

° Blow dust, dirt, or etc, off the lens surface by the blower contained in the cleaning kit as shown below.



Removal of dirt or dust

Technics

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Panasonic Tokyo Office
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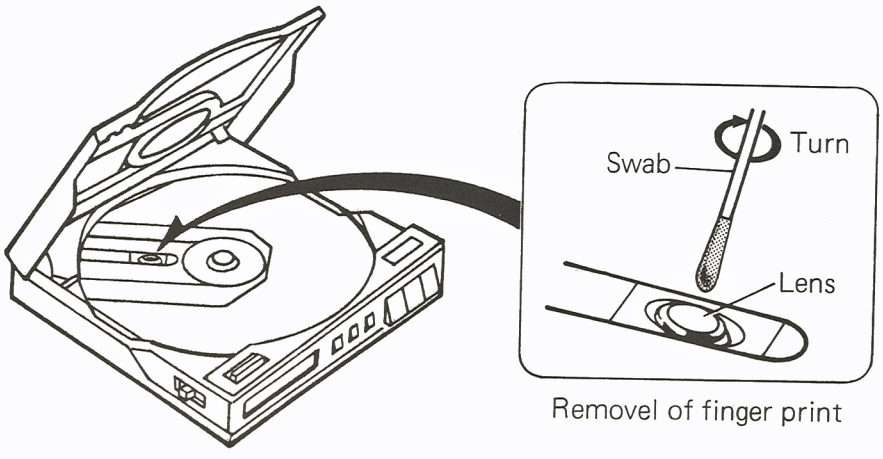
6th Floor, World Trade Center Bldg.,
No. 4-1, Hamamatsu-cho 2-Chome,
Minato-ku, Tokyo 105, Japan

(3). Removing method of finger print or the like

- Wet a swad with a little volume of the lens cleaning liquid contained in the cleaning kit. Wipe the surface of the lens with the wet swab by turning the swab.
- Don't apply a soiled portion of the swab to the lens surface again.

(Note) Cleaning may be made by applying pressure to some degree to the lens.

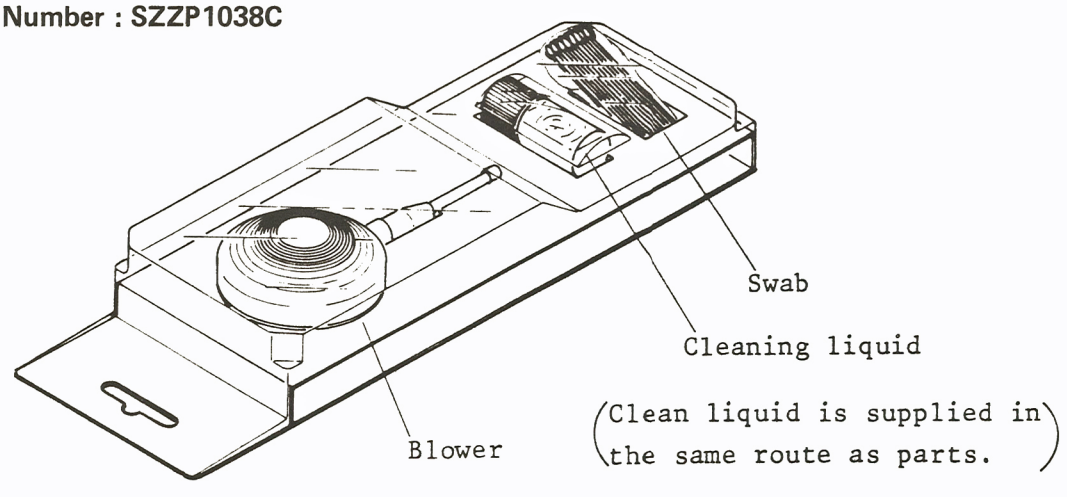


Removel of finger print

Warning

- Don't apply the cleaning liquid to the lens directly, also don't wet the swab with the cleaning liquid more than necessary, Otherwise the liquid may enter the optical pick-up.
- Wipe the lens lightly.
- If the liquid is applied to the lens in excess, wipe off the liquid with a new dry swab

Kit Item Number : SZZP1038C



Description	Parts number	Kit number
Blower	- - - - - - - - - - -	SZZP1038C
Cleaning liquid	SZZP1050C	
Swab (50psc)		

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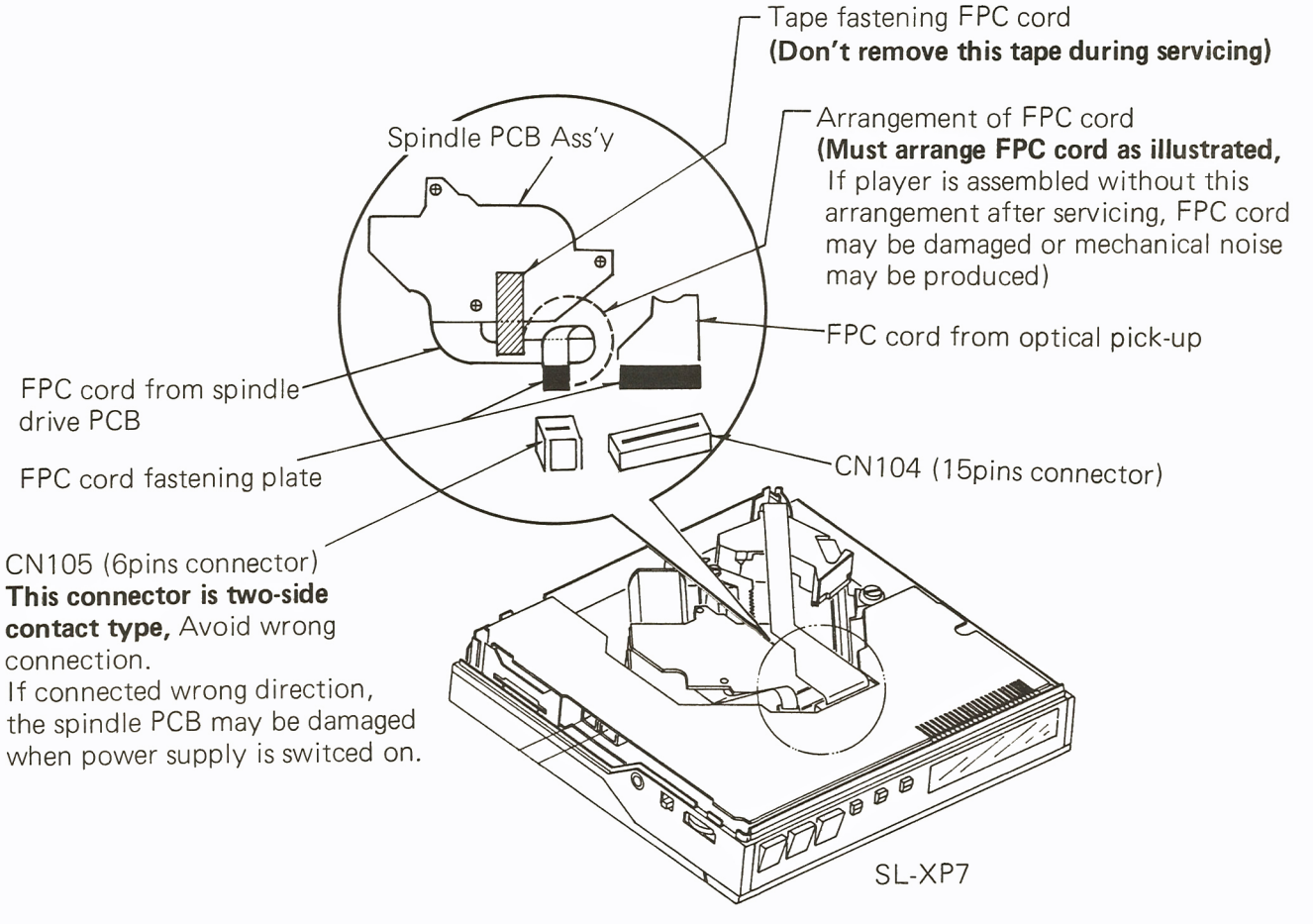
860110500 Ⓚ MIZUTA

ORDER NO. HAD8601335T0
A6

Technical Information

Cautions and advice on assembly procedure of SL-XP7 and other portable CD player

Adhere to the following notes for preventing accidents at aervicing



(Note)
Insert FPC cord positively into connectors (CN104 and CN105) till it bottoms out.

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Printed in Japan
860110500 Ⓚ MIZUTA

ORDER NO. HAD8606606T0
A6

Technical Information

Supplement

PROCEDURE FOR IMPROVING THE PLAYABILITY OF THE PORTABLE CD PLAYER

MODEL SL-XP7, SL-XP3, SL-NP3, RX-CD70, CD-8936

If any of the following symptoms is detected, repair the unit according to the procedures described below. Repair is possible in most cases.

Symptoms

1. Skipped sounds during play.
2. Noise during play.
3. Turntable turns, but the TOC is not read.
4. Reading of the TOC is slow.
5. Play starts too late after skipping.
6. TOC is read, but the disc does not play.

Repair

Step 1	Confirmation of playability	Test disc (SZZP1054C) Track No. 6 : 0.7mm wedge Track No. 13 : 0.7mm black spot
Step 2	Mechanical adjustment	Test disc (SZZP1056C) Track No. 2
Step 3	PD balance (RF) adjustment (VR101)	Test disc (SZZP1054C) Track No. 6 : 0.7mm wedge
Step 4	Tracking offset adjustment (VR105)	Test disc (SZZP1057C) Track No. 3

Note : If the focus lens is dirty, be sure to clean it (cleaning kit SZZP1038C).

Note If the problem is not remedied, repair according to parts 1 and 2 of Technical Information (Order No. HAD8602364T0). Please refer to page 4 for more information.

Panasonic
Technics
Quasar

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Tokyo 105, Japan

Step 1 Confirmation of playability

1. Play back track 3 through 15 of the test disc (SZZP1054C) for 10 seconds each.
2. Check for tracks in witch sound is skipped or noise is generated.
3. Conditions for evaluating playability.

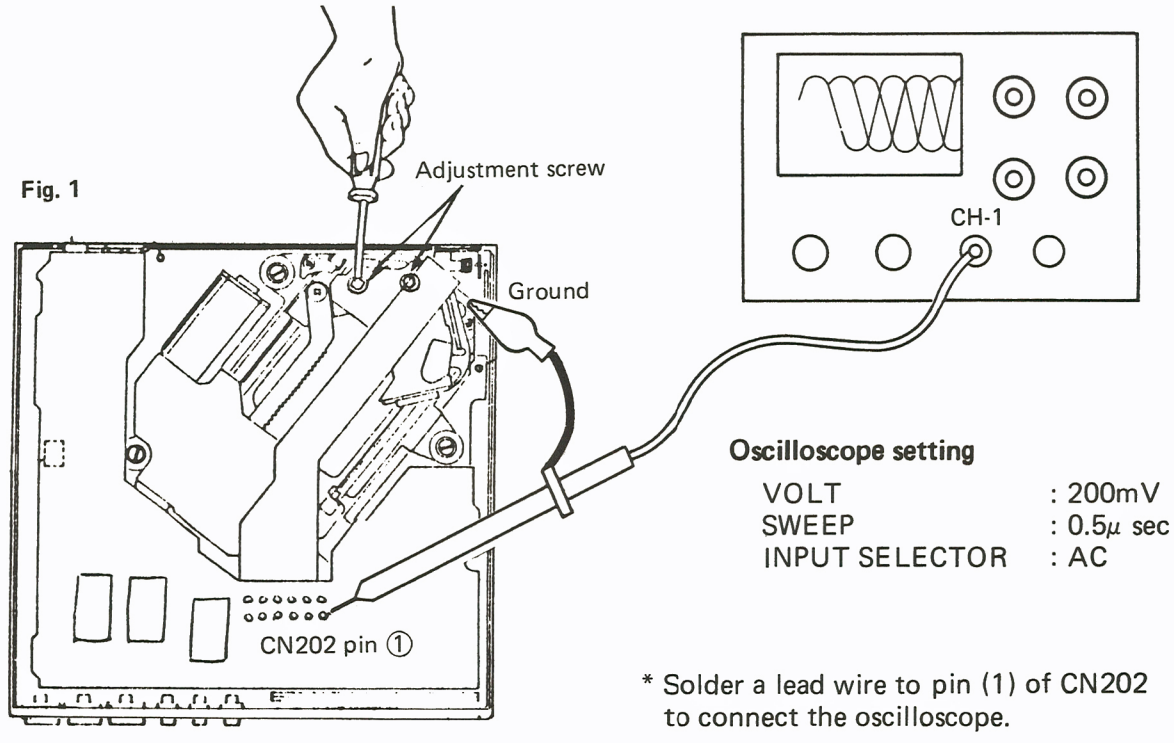
Track No. 6 : 0.7mm or smaller wedge
Track No. 13 : 0.7mm or smaller black spot

Note : If the 0.7mm wedge or black spot causes symptoms, perform the adjustments in steps through 4. Adjust so that wedges or black spots of 0.7mm or smaller pose no problems in playback.

Step 2 Mechanical Adjustment

1. Remove the bottom of the case and connect pin (1) of CN202 to an oscilloscope.

Fig. 1

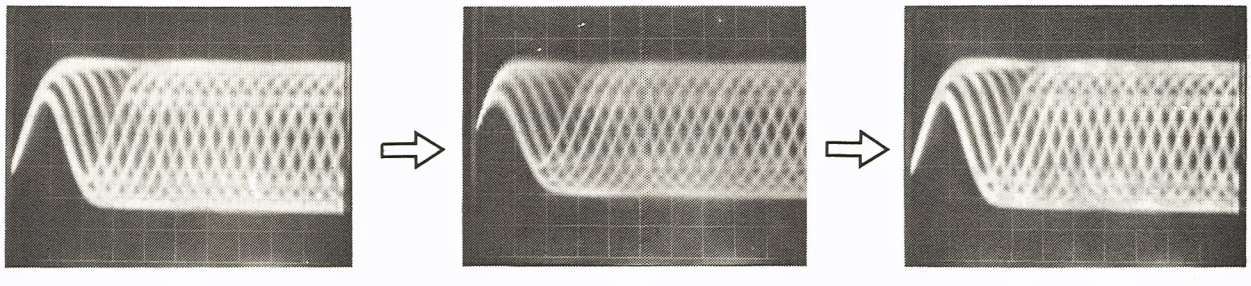


Oscilloscope setting

VOLT	: 200mV
SWEEP	: 0.5μ sec
INPUT SELECTOR	: AC

* Solder a lead wire to pin (1) of CN202 to connect the oscilloscope.

2. Play track No. 2 of the test disc (SZZP1056C).
3. Turn the two adjustment screws on the optical pickup as shown in the figure to maximize the RF waveform and minimize the vertical jitter. (Fig. 2)



(A) (B) (C) OK

Fig. 2

Step 3 PD Balance (RF) Adjustment

1. Play back the test disc (SZZP1054C) and monitor the sound through headphones.
2. Play track No. 6 (0.7mm wedge).
3. Turn VR101 to where the noise disappears.
   (Play back the tracks in witch noise is produced and adjust until the noise is minimum.)

Note : If noise is not disappeared, adjust VR101 until the RF waveform becomes as shown in Fig. 2 (C).

Step 4 Tracking Offset Adjustment

1. Connect an oscilloscope to the CD player as shown in Fig. 1.
2. Play track No. 3 of the test disc (SZZP1057C).
3. Make the following setting on the oscilloscope.

Voltage	: 500mV
Sweep	: 0.5 ms
Input selector	: AC
Mode	: NORM Trigger CH1

4. Produce the following waveform and adjust VR105 so that the point specified in Fig. 3 becomes flat.

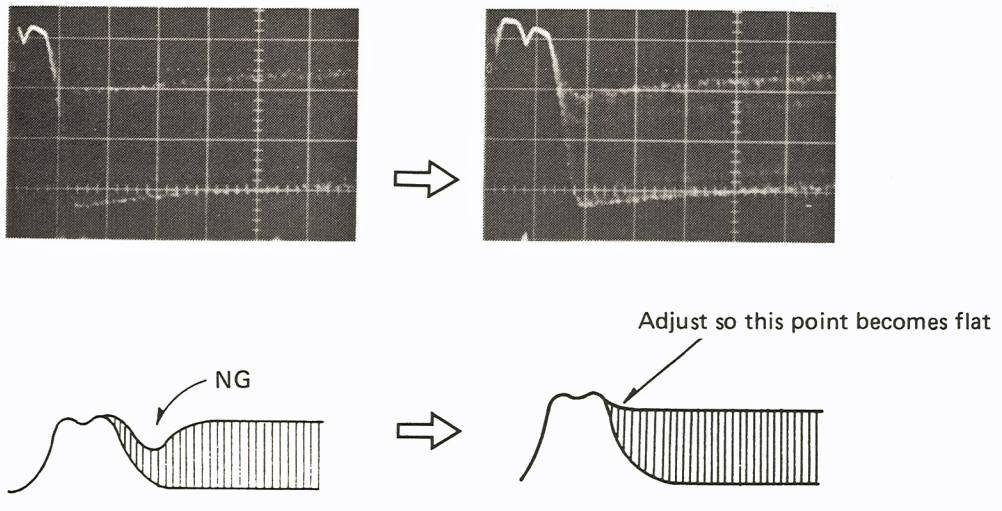


Fig. 3

Note : After performing steps 2 through 4, reconfirm playability by making sure the 0.7mm wedge and black spot pose no problems.

Note : Remove the CD section of the RX-CD70, and connect it to an oscilloscope and perform and adjustment in the same way.

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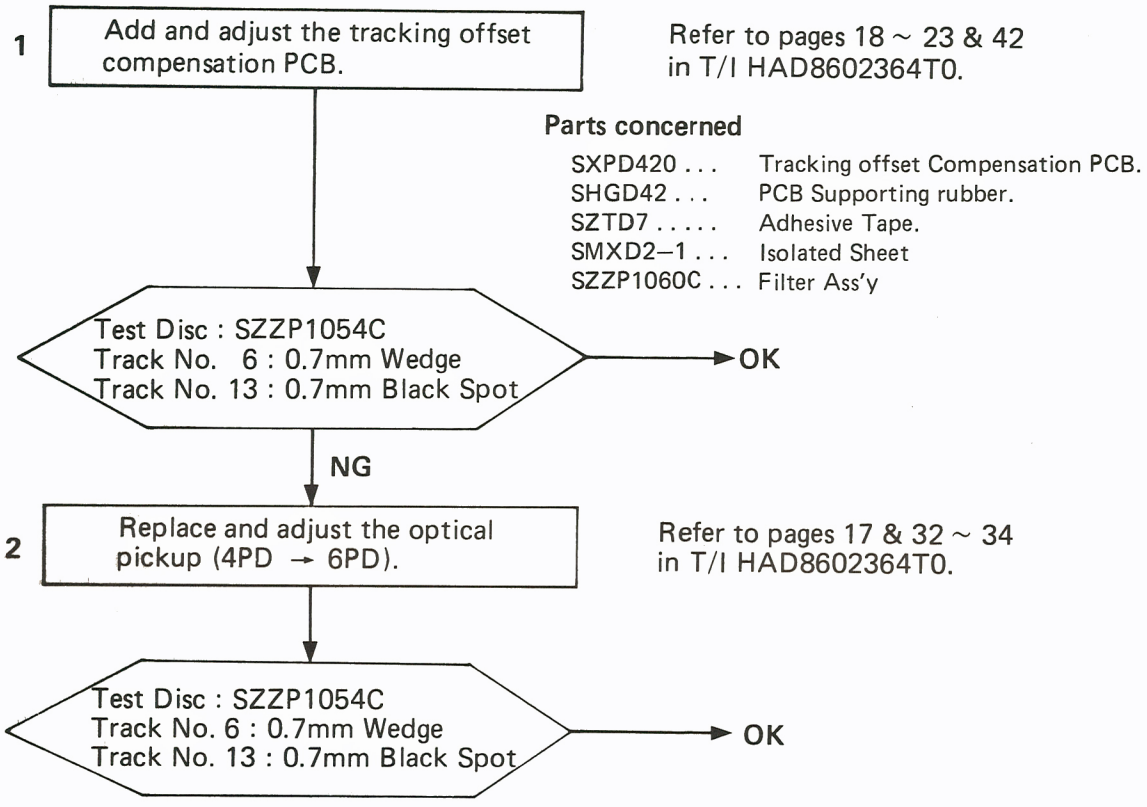
860603000Ⓚ KM

PART II (REFERENCE)

Step 1 thru 4 are quite enough for nearly perfect servicing.
To further improve the playability, take the following actions.



Note : As charted above, add the trackinging offset compensation PCB first. This addition and adjustment provides for a satisfying level in pleyability. The optical pickup replacement is only expected when a client asks you to further improve the playability.

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ORDER NO. HAD8601332S0
A6

Service Manual

Supplement

COMPACT disc DIGITAL AUDIO

DIGITAL

Portable CD Player

Compact Disc Player

SL-XP7

Color

(K)...Black Type
(S)...Silver Type

Adjustment Manual

Areas

[M] ..... U.S.A.
[MC] ... Canada
[E] ..... Switzerland and Scandinavia
[EK] .... United Kingdom
[XL] .... Australia
[EG] ... F.R. Germany
[EB] .... Belgium
[EH] .... Holland
[EF] .... France
[Ei] ..... Italy
[EC] .... Czechoslovakia
[XA] .... Southeast Asia, Oceania, Africa, Middle Near East and Central South America
[XM] ... Central South America
[PA] .... Far East PX
[PE] .... European Military
[PC] .... European Audio Club

Please use this manual together with the service manual for Model No. SL-XP7, Order No. HAD8601325S0.

A. Turntable Height Adjustment

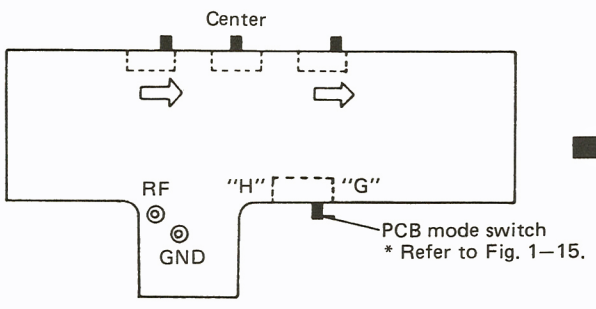
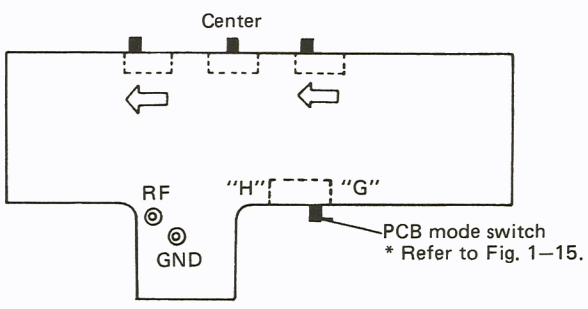


Fig. 3-10

Position the switches of the PCB connection cord as shown in Fig. 3–10.

CORRECT



Technics

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6th Floor, World Trade Center Bldg.,
No. 4-1, Hamamatsu-cho 2-Chome,
Minato-ku, Tokyo 105, Japan

Printed in Japan
860110200 Ⓚ KM

ORDER NO. HAD8601325S0

Service Manual

Supplement

COMPACT disc DIGITAL AUDIO

DIGITAL Portable CD Player

Compact Disc Player

SL-XP7

Color

(K)...Black Type
(S)...Silver Type

Adjustment Manual

Areas

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[EF] .... France
[Ei] ..... Italy
[EC] .... Czechoslovakia
[XA] .... Southeast Asia, Oceania, Africa, Middle Near East and Central South America
[XM] ... Central South America
[PA] .... Far East PX
[PE] .... European Military
[PC] .... European Audio Club

Please use this manual together with the service manual for Model No. SL-XP7, Order No. HAD8509260G0. / HAD8510283C9.

Technics

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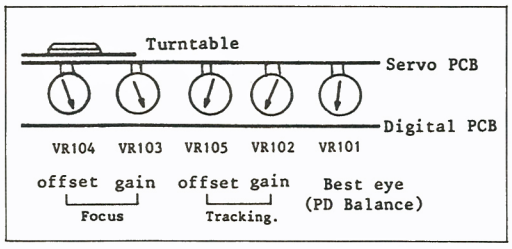
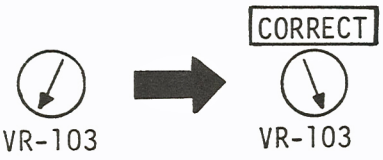
No. 4-1, Hamamatsu-cho 2-Chome,
Minato-ku, Tokyo 105, Japan

(4) Initial setting points of adjusting variable resistors



- Adjusting variable resistors

The player operates but not optimum at the above settings of the adjusting variable resistors. Adjust them according to the adjusting procedure. Must conduct the electrical adjustment when any electrical part is replaced. Perform 1 optical pick-up adjustment and 2 electric adjustment in the stated order when the optical pick-up is replaced.



- Einstellung der Regelwiderstände

Das Gerät funktioniert bei der oben dargestellten Einstellung der Regelwiderstände, aber nicht optimal. Gemäß dem Einstellvorgang einstellen. Die elektrische Einstellung muß immer vorgenommen werden, wenn ein Teil ausgetauscht wird. Nach dem Auswechseln des optischen Abnehmers ① Einstellung des optischen Abnehmers und ② die elektrische Einstellung in dieser Reihenfolge vornehmen.

- Réglage des résistances variables

L'appareil fonctionne, mais non dans les conditions optima des réglages précédents des résistances variables d'ajustement. Les régler selon la procédure d'ajustement. On devra réaliser un réglage électrique lorsque n'importe quel élément électrique est remplacé. Effectuer ① réglage de la tête de lecture optique et ② le réglage électrique dans l'ordre indiqué lorsqu'on remplace la tête de lecture optique.

- Ajuste de las resistencias variables

Si tocadiscos opera de forma anormal con dichos ajustes de los resistores variables, ajustarlos según el procedimiento de ajuste. Se hará el ajuste eleéctrico cuando se cambie cualquier pieza eléctrica. Ajustar el captador óptico y dos ajustes eléctricos en dicho orden cuando se cambie el captador óptico.

3-2. Adjustment after Replacement of Optical Pick-Up

Preparation for Adjustment and Adjusting Points

On completion of replacing the optical pick-up, set up the player so that power-on check can be conducted.
(Set up as shown in Fig. 1-12)

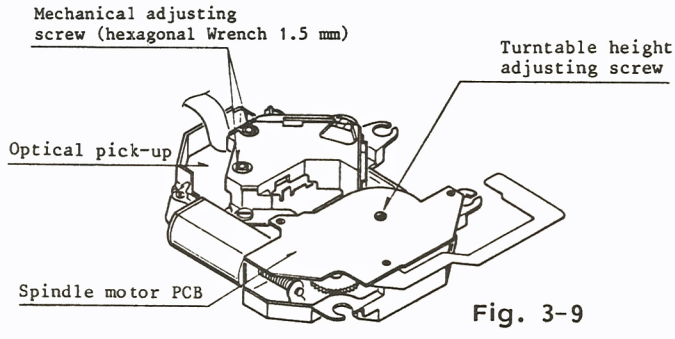


Fig. 3-9

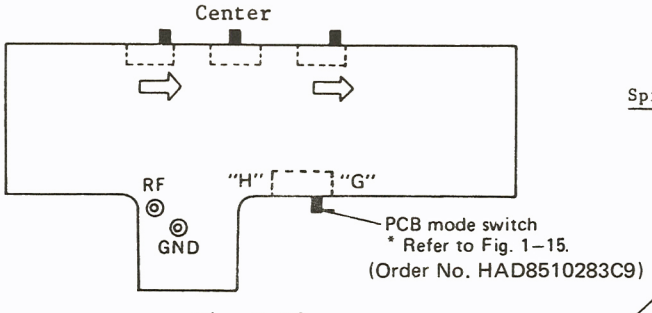


Fig. 3-10

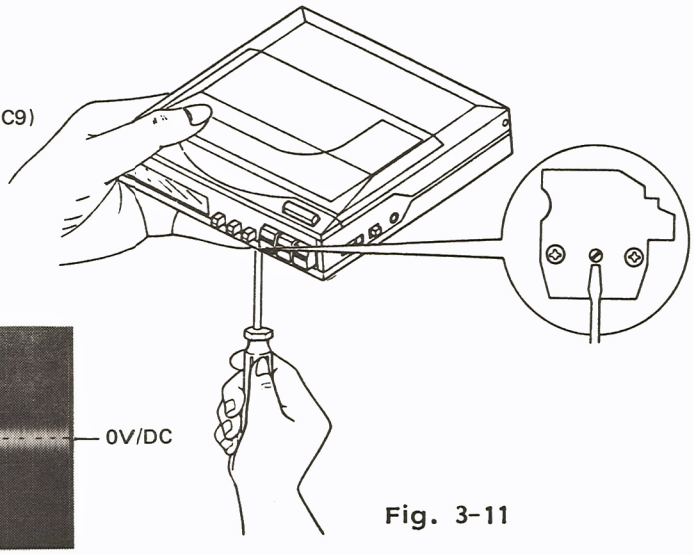


Fig. 3-11

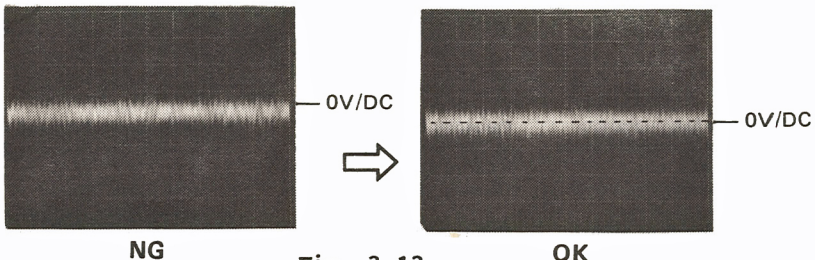


Fig. 3-12

ENGLISH

A. Turntable Height Adjustment

① Position the switches of the PCB connection cord as shown in Fig. 3-10.
② Set the oscilloscope to DC zero balance.
③ Connect the oscilloscope to the terminals FEG and GND of the PCB connection cord.

Oscilloscope Setting
VOLT ..... 100 mV
SWEEP ..... 5 msec.
Input selector ..... DC

④ Place the test disc (SZZP1014F) to the disc holder.
⑤ Hold the set by the hand with the top face up as illustrated in Fig. 3-11.
⑥ Turn on the power supply switch of the player to the playing status.
⑦ Be sure that the Waveform shown in Fig. 3-12 "OK" is displayed on the oscilloscope.
⑧ If not, adjust the turntable height adjusting screw shown in Fig. 3-9, so that the waveform shall be 0 ± 50mV/DC as shown in Fig. 3-12 "OK". (Handle the turntable height adjusting screw the care because the screw is plastic.)
⑨ If mechanical noise is present, please readjusting again.
⑩ Turn off the power supply switch.
⑪ After adjust, add the lock screw glue "like a nail paint" in turntable height adjusting screw on spindle PCB.

DEUTSCH

A. Einstellung der Drehtellerhöhe

① Die Schalter des Schaltplattenverbindungskabels wie in Abb. 3-10 einstellen.
② Das Oszilloskop auf OV-Gleichstrom-Balance einstellen.
③ Das Oszilloskop an die Klemmen FEG und GND des Schaltplattenverbindungskabels anschließen.

Einstellung des Oszilloskops
Spannung 100mV
Ablenkung ..... 50msec.
Eingangsumschalter ..... Gleichstrom

④ Den Testdisk (SZZP1014F) einlegen.
⑤ Wie in Abb. 3-11 das Gerät mit der Oberseite nach oben in der Hand halten.
⑥ Den Netzschalter des Stromzufuhr zum Geräts auf "EIN" stellen.
⑦ Darauf achten, da die auf dem Oszilloskop dargestellte Signalform wie in Abb. 3-12 "in Ordnung" aussieht.
⑧ Falls sie davon abweicht, wie in Abb. 3-9 die Einstellschraube fur die Drehtellerhöhe einstellen, bis die Signalform wie in Abb. 3-12 "in Ordnung" 0 ± 50mV/Gleichstrom darstellt. (Die Einstellschraube für die Drehtellerhöhe vorsichtig handhaben, da sie aus Plastik ist.
⑨ Falls ein mechanisch erzeugtes Geräusch auftritt, muß die Einstellung noch einmal vorgenommen werden.
⑩ Netzschalter auf "AUS" stellen.
⑪ Nach erfolgter Einstellung die Justierschraube für die Drehtellerhöhe mit nagellackähnlichem Kleber auf der Wellenschalttafel arretieren.

FRANÇAIS

A. Réglage de la hauteur de la platine

① Positionner les commutateurs de câble de raccordement de la plaquette à circuits imprimés comme il est montré à la Fig. 3-10.
② Régler l'oscilloscope sur un équilibrage de zéro C.C.
③ Raccorder l'oscilloscope aux bornes FEG et GND du câble de raccordement de la plaquette à circuits imprimés.

Réglage de l'oscilloscope
TENSION ..... 100 mV
BALAYAGE ..... 5 msec.
Sélecteur d'entrée ..... C.C.

④ Installer le disque d'essai (SZZP1014F) dans le dispositif du support de disque.
⑤ Tenir l'appareil avec la main avec la face supérieure vers le haut, comme il est montré à la Fig. 3-11.
⑥ Mettre en marche l'interrupteur d'alimentation en courant de l'appareil sur une condition d'audition.
⑦ S'assurer que la forme d'onde montrée à la Fig. 3-12 "OK" soit affichée sur l'oscilloscope.
⑧ Dans la négative, régler la vis d'ajustage de la hauteur de la platine comme il est montré à la Fig. 3-9, de telle sorte que la forme d'onde soit de 0 ± 50 mV/C.C., comme il est montré à la Fig. 3-12 "OK".
(Manipuler la vis d'ajustage de la hauteur de la platine avec précaution car elle est en plastique.)
⑨ Si un bruit mécanique se produit, veuillez régler à nouveau.
⑩ Mettre hors circuit l'interrupteur d'alimentation en courant.
⑪ Après la mise au point, bloquer la vis de réglage de la hauteur de la platine avec un produit tel qu'un "vernis à ongles" sur la plaquette à circuits imprimés de l'axe.

ESPAÑOL

A. Ajuste de la altura del plato giratorio

① Poner los interruptores de la tablilla de circuítos impresos como se ve en la Fig. 3-30.
② Poner el osciloscopio en el balance de cero de CD.
③ Conectar el osciloscopio a los terminales FEG y de TIERRA de la tablilla de circuítos impresos del cable de conexión.

Fijación del osciloscopio
VOLTAJE 100mV
BARRIDO .....50mseg.
Selector de potencia de entrada ...CA

④ Poner la disqueta de prueba (SZZP1014F) en su soporte.
⑤ Tomar la unidad con la mano con la cara superior hacia arriba como muestra la Fig. 3-11.
⑥ Encender el interruptor de la fuente de energía del tocadiscos, en la estado de audición.
⑦ Asegurarse de que la forma de onda de la Fig. 3-12 "OK", se muestra en osciloscopio.
⑧ De lo contrario, hacer un ajuste con el tornillo de altura del plato giratorio, que se muestra en la Fig. 3-9, para que la formma de onda sea 0 ± 50mV/CD, como se muestra en la Fig. 3-12 "OK".
(Tratar con cuidado el tornillo de ajuste del plato giratorio, porque está hecho de plástico)
⑨ Si se nota ruído mecánico, hacer el ajuste de nuevo.
⑩ Desconectar el interruptor la fuente de energía.
⑪ Después del ajuste, poner goma de seguridad "semejante a laca de uñas" en el tornillo de ajuste de la altura del plato giratorio de la tablilla de impresos del motor de vástago.

Printed in Japan
851208000 Ⓚ KK

■ **AC adaptor**

Power supply:

(Input) For United Kingdom and Australia:
~50/60 Hz, 240V
For continental Europe:
~50/60 Hz, 220V
For others:
~50/60 Hz, 110/127/220/240V

(Output): Dual DC +6V, –6V

Power consumption: 11 W

Dimensions: 51.4 x 75.4 x 95.5 mm
(W x H x D) (For continental Europe)
51.4 x 75.4 x 58.5 mm
(For United Kingdom and Australia)
56.4 x 95.4 x 61 mm
(For other countries)

Weight: 390 g (For continental Europe)
480 g (For United Kingdom and Australia)
550 g (For other countries)

Specifications are subject to change without notice for further improvements.

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ABOUT COMPACT DISCS	4
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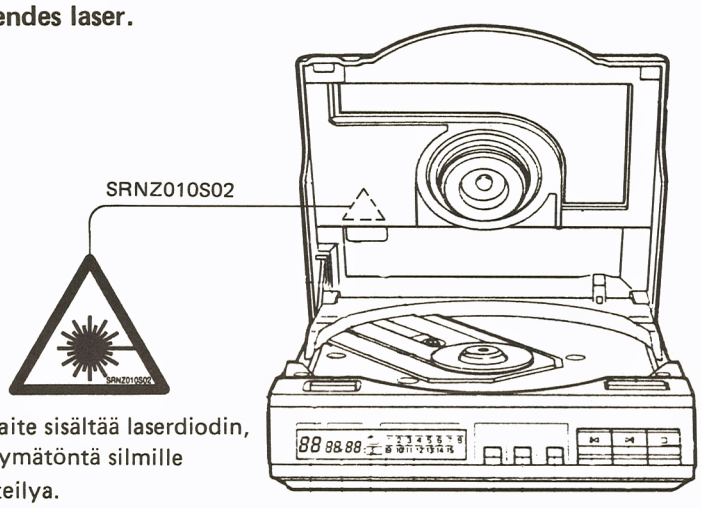
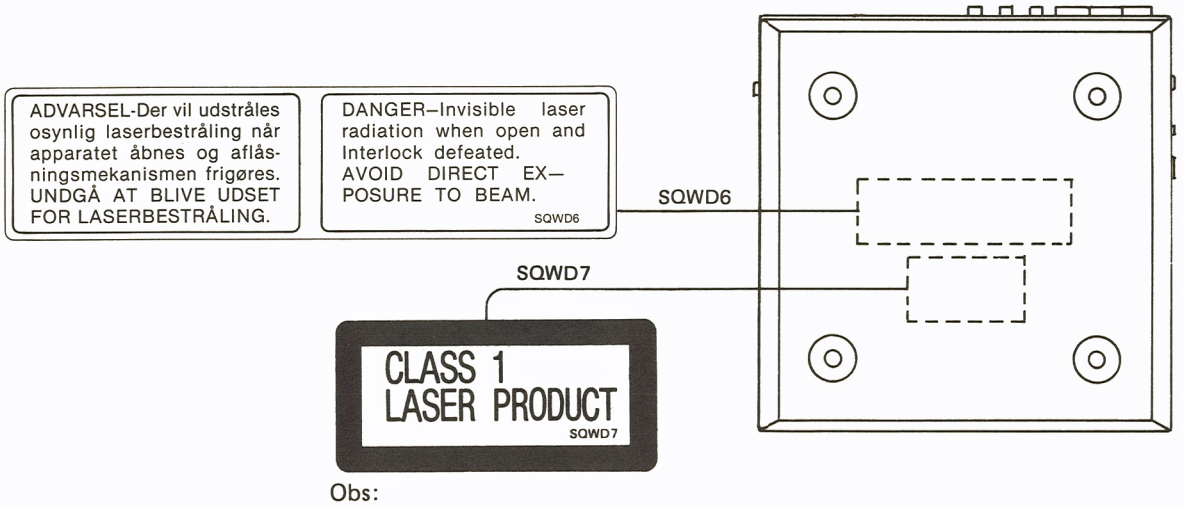
■ PRECAUTION OF LASER DIODE

Caution: This product utillizes a laser diode.
ADVARSEL: I dette a apparat anvendes laser.

- **Use of caution labels**



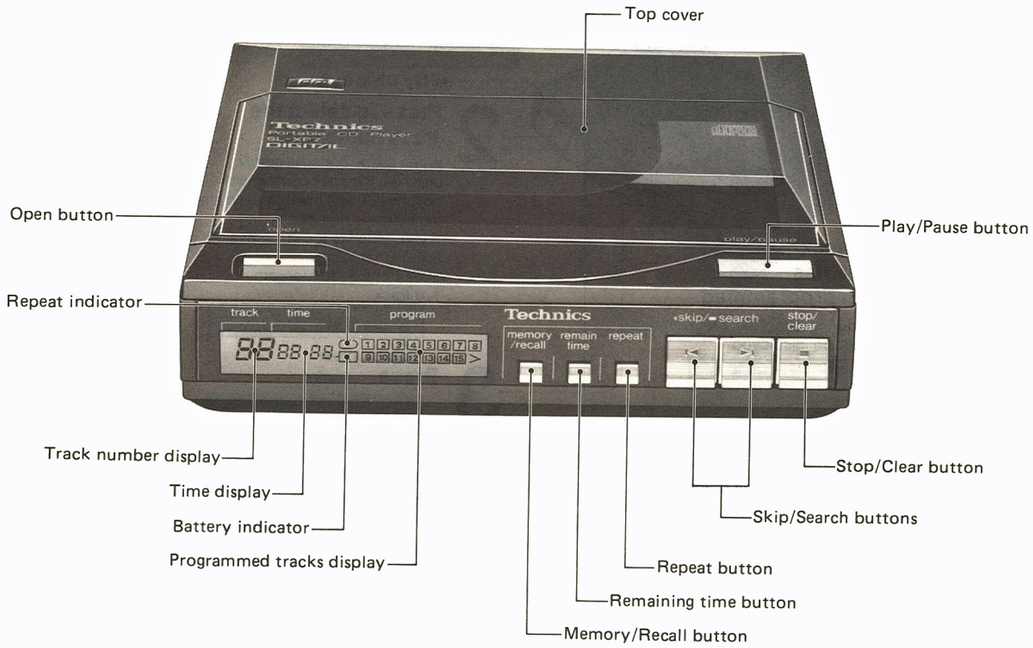
VAROITUS ! Laite sisältää laserdiodin, joka lähettää näkymätöntä silmille vaarallista lasersäteilya.



Obs:
Apparaten innehåller laser
Komponent av höger laserklass
än klass 1.

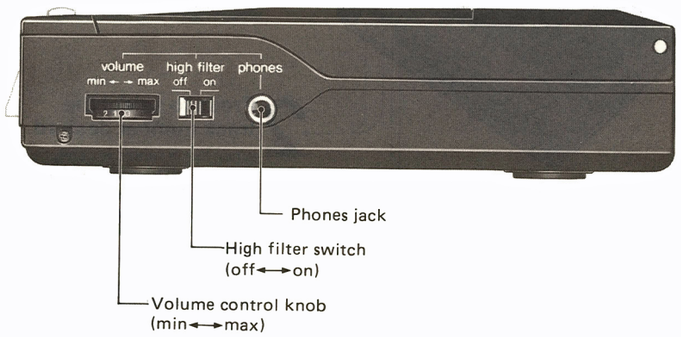
■ LOCATION OF CONTROLS

- **Front Panel**



- **Back Panel**

- **Right Side Panel**



- **Left Side Panel**

■ ABOUT COMPACT DISCS

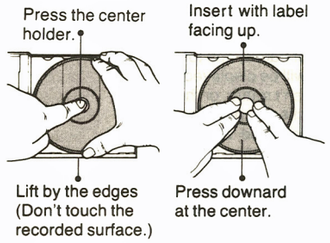
Noise can be caused if the disc is dirty, scratched, warped, etc. Please note the following points.

Compact disc identification.....

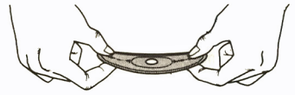
COMPACT disc DIGITAL AUDIO — Use compact discs bearing this mark.

Handing notes

■ When removing/storing from/to the case ...



■ Don't bend discs.



■ Don't ...

- Write with a ballpoint pen, etc. on the label.
- Attach any type of paper, label, etc.

Storage hints

■ Be sure to use the special case.

■ Keep discs away from ...

- Heating equipment and places where the temperature is high.
- Places where there is high humidity or excessive dust.

Maintenance

■ If discs are dirty ...

Clean with a soft, damp cloth, and wipe till dry.

■ Don't use the following ...

- Anti-static cleaners, etc. such as used on ordinary phonograph records.
- Benzine, paint thinner, or any other solvents.

■ PREPARATIONS

Connection to power supply

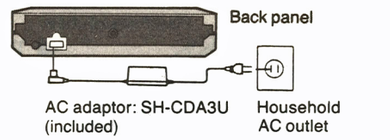
■ Household AC outlet

Use the portable CD AC adaptor (included).

■ Rechargeable battery

You can enjoy the superb sound of compact discs anywhere you are by using the special carrying case SH-CDB7, sold separately.

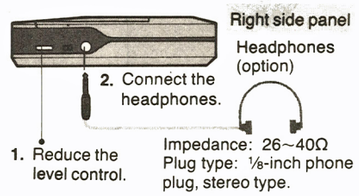
CAUTION FOR AC ADAPTOR: Charge only the battery, Model SH-CDB7. Other types of battery may burst causing personal injury and damage.



(This configuration of the AC adaptor may differ according to the area.)

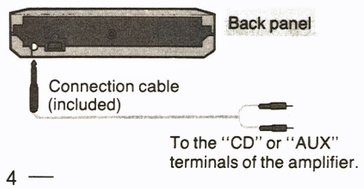
Listening through headphones

- Listen at a moderate volume level to avoid excessive "sound impact" on your ears.
- For safety, don't listen while driving, and reduce the volume level while walking.



Listening through an audio system

- Switch OFF the amplifier's power before connecting this unit.
- Do not connect to the record player PHONO terminals of the amplifier.



■ OPERATION

(The following explanation will use, as an example, a compact disc on which are recorded 7 tracks, with a total playing time of 49 minutes and 58 seconds).

This unit is designed, as a portable unit, to resist vibration. Note, however, that severe impacts to the unit might cause interruption of the sound. The disc will not be damaged, because this unit employs the laser system.
Sound may be interrupted if there is an external impact during the first track. If this happens, press the stop/clear button and then press the play/pause button to resume play.

To listen from the disc start (automatic play)

To listen to the disc from start to finish ...

1 "on"

If a disc is already in the unit, the disc will start rotating. The total number of tracks, and the total playing time, will be displayed.

2 **Press, and open until a "click" is heard.**

3 **Insert the disc.**

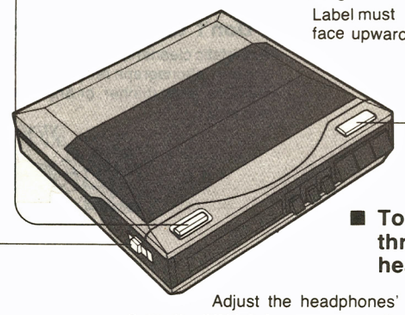
Total playing time
Total number of tracks

The disc will begin rotating when the top cover is closed, and the total number of tracks, and total playing time, will be displayed.
If the disc doesn't rotate, or the number of tracks and playing time are not displayed, switch the power OFF and then ON again.
(The > mark will illuminate if there are more than 15 tracks.)

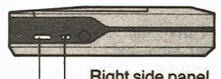
Label must face upward.

4 **Press.** (Play will start.)
Track number flashes.

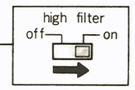
Playing time
Track number.



■ To listen through headphones

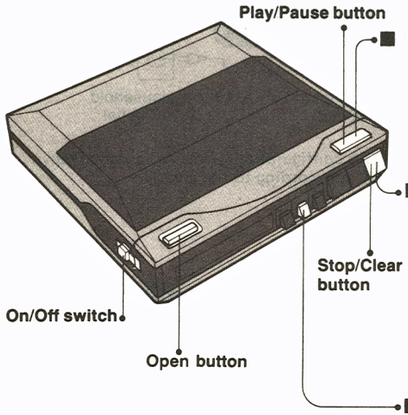


Right side panel



Adjust the headphones' volume level.
Set to "on" if high-frequency sound range is too strong

■ To listen through an audio system
Adjust the amplifier, to preference.



■ Press to stop play for a moment.

The playing time flashes.

When pressed again, play will resume from where it was

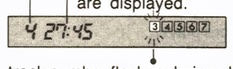
■ Press to stop play before disc ends.

The disc will stop, and the disc's total number of tracks and total play time will be displayed.

The disc will play from the start when the play/pause button is pressed.

■ Press if you want to know the remaining time.

- During play, when pressed, the remaining number of tracks and remaining play time are displayed.



The track number flashes during play.

- The previous display is shown when pressed again.

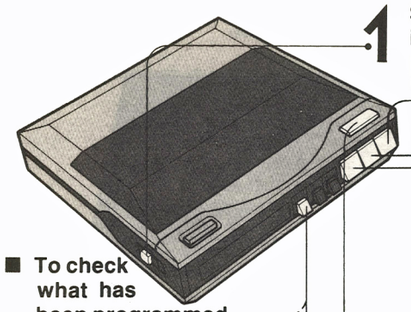
■ When play ends

(The disc stops rotating and the total number of tracks and total playing time are displayed.)

- Press the open button and take out the disc.
- Be sure to switch OFF the power.

To listen to tracks in a certain order (programmed play)

To listen in any desired order, such as the 3rd track first, the 5th track second, and the 1st track last...

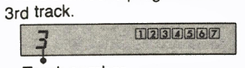


1 **Switch ON the unit and insert the disc.** (See page 5.)

Stop/Clear button

2 **Press to select the track number.**

When the ▶| button is gently pressed, the track number will advance by one number each time the button is pressed.
If you advance too far, press the |◀ button to return.
Press 3 times to program the 3rd track.



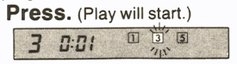
Track number

3 **Press.**

order
Track number
Indicates that a track has been programmed.

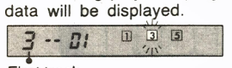
4 **Repeat steps 2 and 3 to program the desired tracks in the desired order.**
(A maximam of 15 tracks can be programed.)

5 **Press.** (Play will start.)

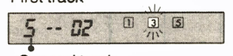


■ To check what has been programmed

Press during play; the programmed data will be displayed.



First track



Second track

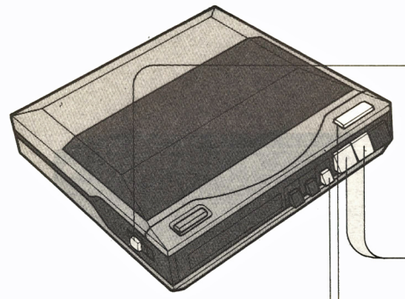
When the programmed data display ends, the display will return to the play display mode.

■ To cancel the programming

Press the stop/clear button.
Note: All programming will be cancelled when the disc is taken out, or if play is stopped before the end.

To listen immediately in a certain track (direct play)

To listen, for example, to the 3rd track immediately. Any desired track can be found and played at once.



1 **Switch ON the unit and insert the disc.**
(See page 5.)

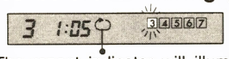
2 **Press to select the track number desired.**

When the ▶| button is gently pressed, the track number will advance by one number each time the button is pressed.
If you advance too far, press the |◀ button to return.

3 **Press.** (Play will start.)

To listen to certain track(s) repeatedly (repeat play)

■ Press before or during play.



The repeat indicator will illuminate.
Cancelled when pressed again.

- All tracks (if during automatic play) will be repeated.
- During direct play, from selected track to last track, and then all tracks, will be repeated.
- Each programmed track (if during programmed play) will be repeated.

To listem to certain tracks in random order (skip play)

While listening to a track, this feature allows to find the beginning of the next tracks, or restart the presently played track.

■ **Press once lightly to listen to the next track.**

If, for example, the 5th track is being played, the 6th track will be played when pressed.

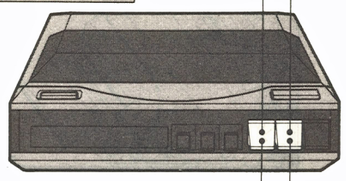
■ **Press once lightly to listen to the presently played track again.**

■ **Press twice, lightly, to listen to the track before the one now being played.**

Note: During programmed play, the order will change to the programmed order.

To search for a certain track (search play)

Any desired position on the disc can be found by fast forward or fast reverse during disc play.



■ **Press for fast reverse; release at the desired position.**
■ **Press for fast forward; release at the desired position.**

- The pick up moves slowly at first and then rapidly, if the search button is held down.
- The desired track can be found while listening to the disc sound (at about 1/4 the normal volume level).
- During programmed play, search is possible only within the track being played. To search for some other track, follow the "skip" procedure to find the start of the track, and then fast forward or fast reverse as necessary.

■ ABOUT PORTABLE CD CARRYING CASE: SH-CDB7 (OPTION)

Operation

3 Close the cover and check to be sure it is locked.

2 Place the unit in the carrying case, aligning it with the "DC in" terminal.
Note: This terminal is somewhat flexible for easy insertion of the player into the battery pack.

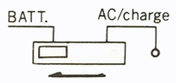
Carrying Case

4 Tighten the screw on the back panel.

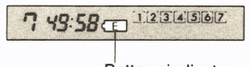
1 Pull the buttons to open the cover.

Portable CD Player

5 Set the power source switch to the "BATT" position on the front panel.



Charge the battery when...
- The unit is used for the first time, or ...
- If has not been used for a long time, or ...
- The battery indicator flickers.

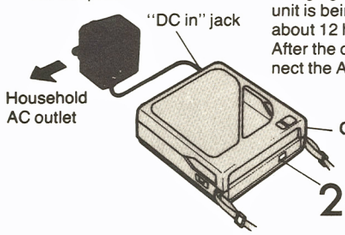


Battery indicator

Charging

1 Connect the AC adaptor.

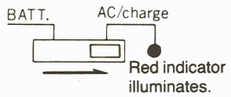
3 If the unit is not being used, the charging requires about 7 hours; if the unit is being used during charging, about 12 hours will be required. After the charging is finished, disconnect the AC adaptor.



2 Set the power source switch to "AC/charge" position.

■ To charge while playing discs

After placing the player in the carrying case, follow the steps above.



Red indicator illuminates.

Notes:
1. In the "AC/charge" position, without the AC adaptor connected, the fluorescent display will illuminate and the repeat indicator will flash, but the unit will not operate. This is normal.
2. When not using the CD player, be sure to switch it OFF for protection of battery consumption.

Charging notes

- Do not let metal objects touch the terminals, since this could cause a short-circuit.
- Keep away from fire.
- There may be a slight amount of heat generated during charging. This is not abnormal.
- If the battery becomes weak and requires charging soon after having been charged, the battery is consumed and should be replaced. Please consult with your dealer.
- Do not charge for longer than the specified time. Doing so might cause a decrease in battery performance.

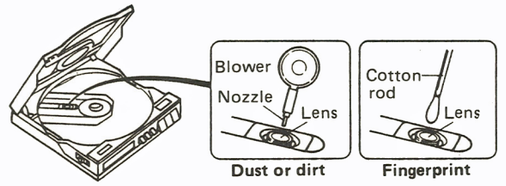
CAUTION: Charge by using the AC adaptor, Model SH-CDA3U. The battery charged by other types of AC adaptor may burst causing personal injury and damage.

■ CLEANING OF LENS

If the lens is stained causing sound skip or operation failure, open the top cover by pressing the open button, and clean the lens.

• To remove dust or dirt

Blow the lens with the blower provided in the cleaning kit to remove dust or dirt.

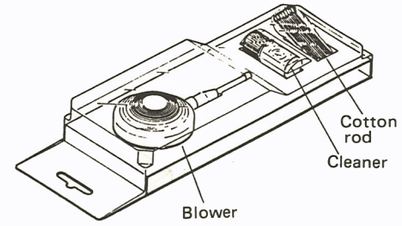


• To remove fingerprint

If the blower is not enough, moisten the cotton rod with with the lens cleaner solution and wipe the lens with it from center of the lens to outside.

Cautions:
- Do not directly apply the cleaner solution to the lens. Do not apply too much solution to the cotton rod or otherwise the solution will flow into the player.
- Wipe the lens carefully. Do not give too much stress to the lens or otherwise it may scratch the lens or cause optical pickup trouble.
- If the solution should be too much applied, wipe the lens with a dry cotton rod.

Lens cleaning kit (Part No. : SZZP1038C)

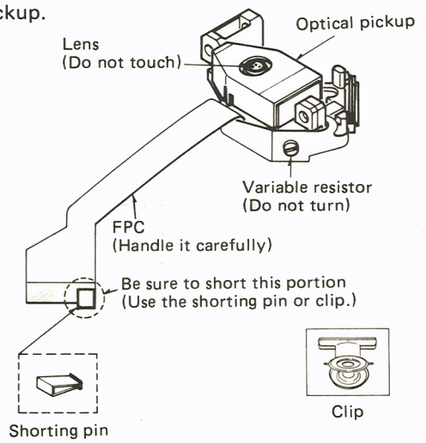


■ HANDLING PRECAUTIONS FOR OPTICAL PICKUP

The laser diode in the optical pickup may break down due to potential difference caused by static electricity of clothes or human body.
So, be careful of electrostatic breakdown during repair of the optical pickup.

• Handling of optical pickup

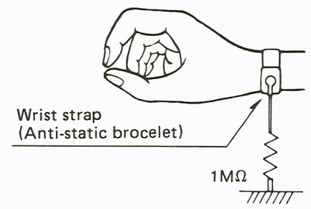
1. Do not give excessive shock to the optical pickup because it is of extremely high precision structure.
2. To prevent the breakdown of the laser diode, an anti-static shorting pin is inserted into the FPC.
   When removing or connecting the short pin, finish the job in a short time.
3. Take care not to give excessive stress to the FPC.
4. Do not turn the variable resistor (laser power adjustment). (It has been already adjusted.)

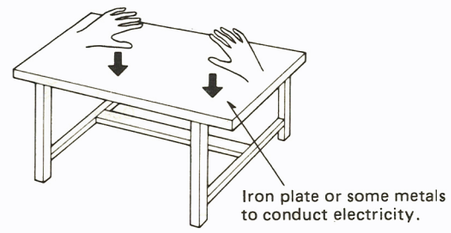


• Grounding for electrostatic breakdown prevention

1. Human body grounding
   Use the anti-static wrist strap to relieve the static electricity from your body.
2. Work table grounding
   Put a conductive material (sheet) or steel sheet on the area where the optical pickup is placed, and ground the sheet.

Caution:
The static electricity of your clothes will not be grounded through the wirst strap. So, take care not to let your clothes touch the optical pickup.





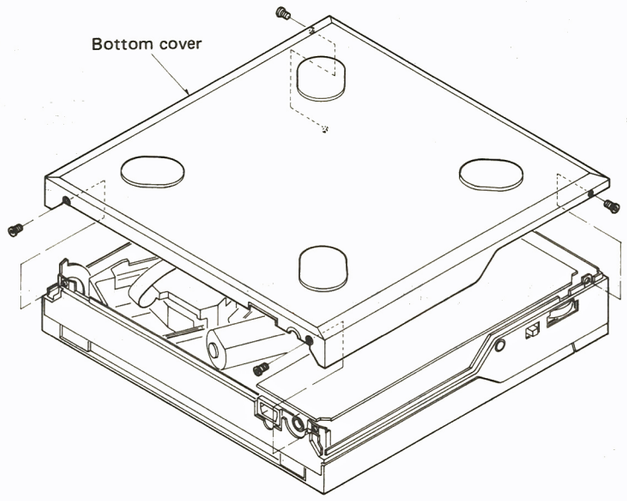
■ DISASSEMBLY INSTRUCTIONS

- **Cautions for laser diode light emission**

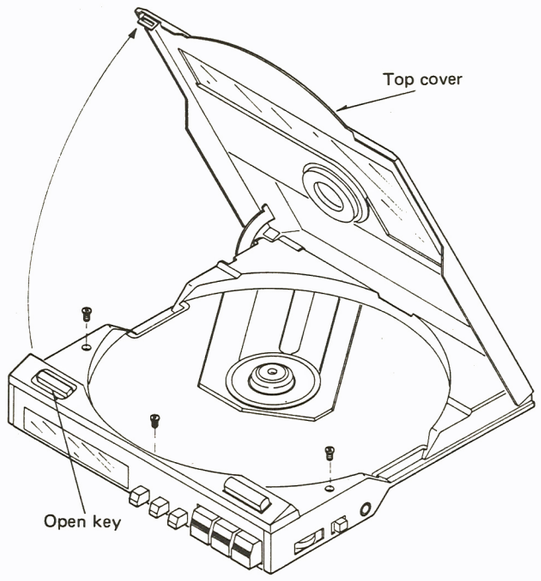
In this unit, the compact disc information is read by the laser beam diffused from the laser diode in the optical pickup. It is dangerous to directly look at the laser beam or to let it touch your body. During the normal operation of this unit, the laser diode will not emit light unless the disc holder is closed and S101 (laser ON/OFF switch) is turned ON. When servicing the unit, note that the laser diode emits lights if power switch is turned on with S101 ON.

- **This unit uses FPC and care should to bakes during assembly and disassembly.**

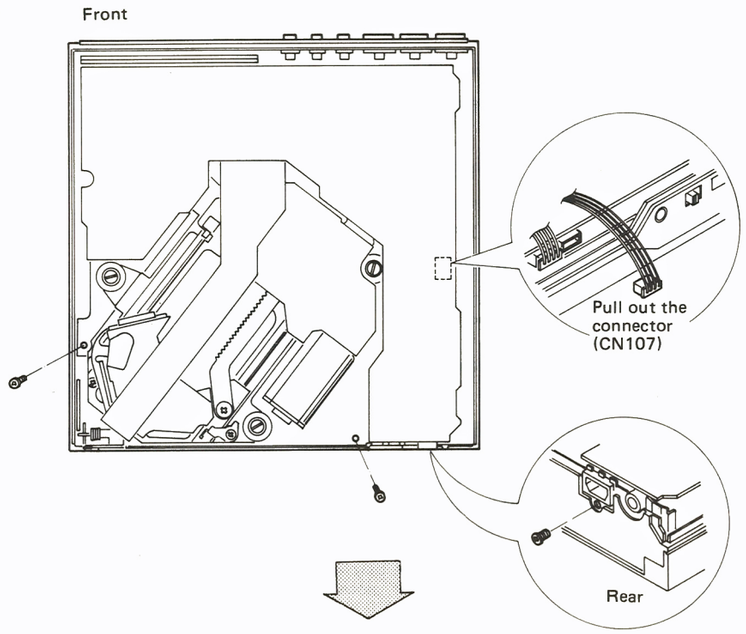
Ref. No. 1	How to remove the bottom cover	1. Turn over the set and remove the 4 screws. 2. Lift up the bottom cover.
Procedure 1		



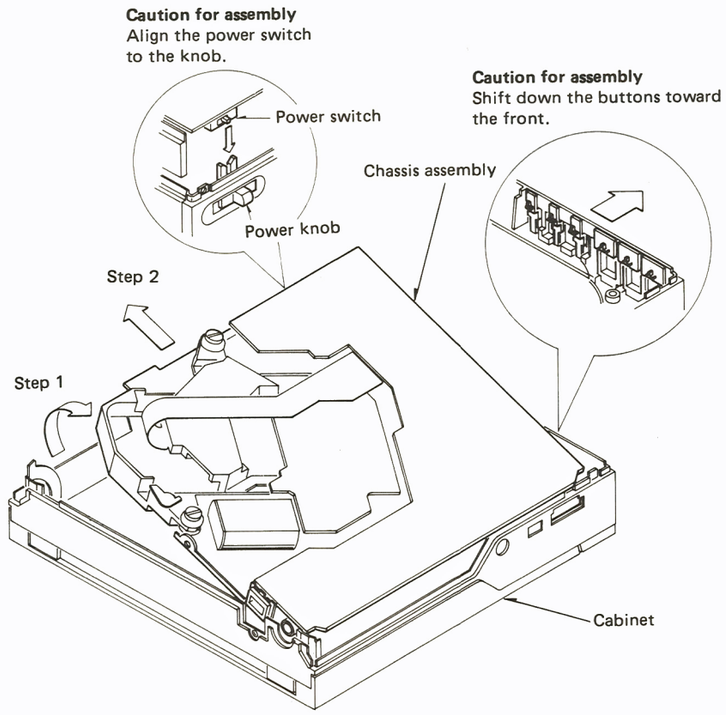
Ref. No. 2	How to remove the chassis assembly	1. Open the top cover and remove the 3 screws.
Procedure 1 ➡ 2		



2. Remove the 3 setscrews of the chassis assembly, and pull out the connector (CN107).



3. Remove the chassis assembly by steps 1 and 2.

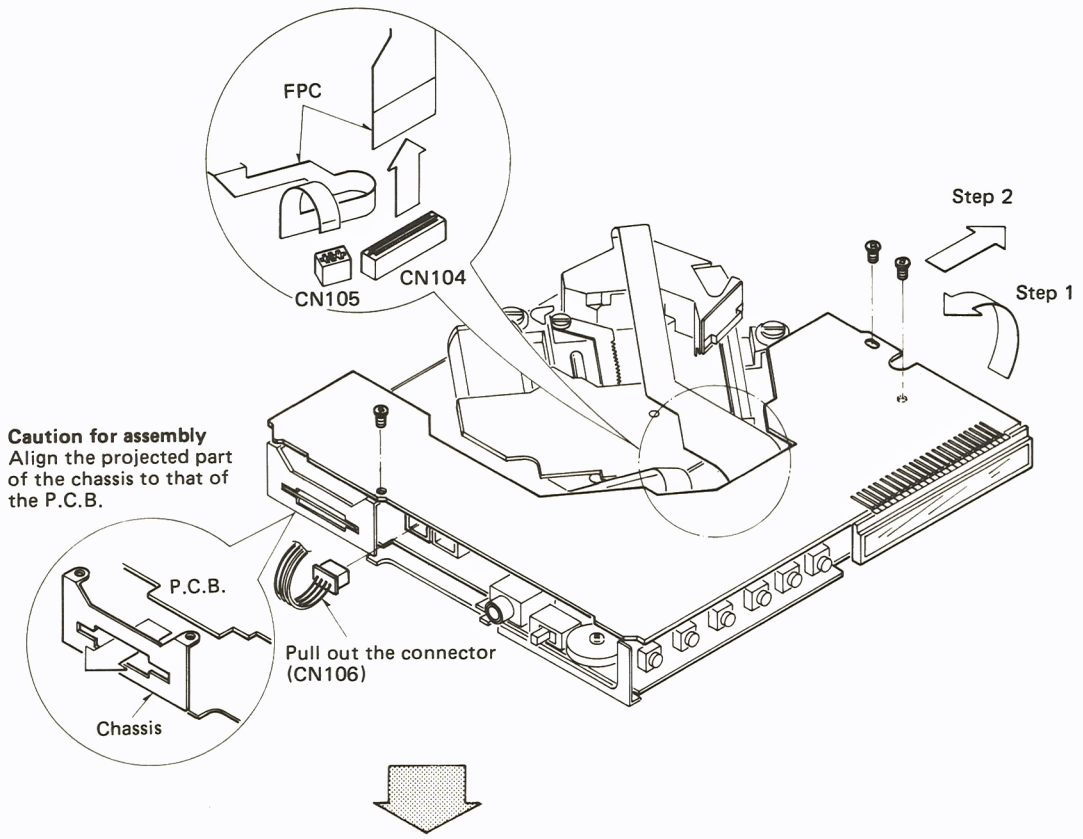


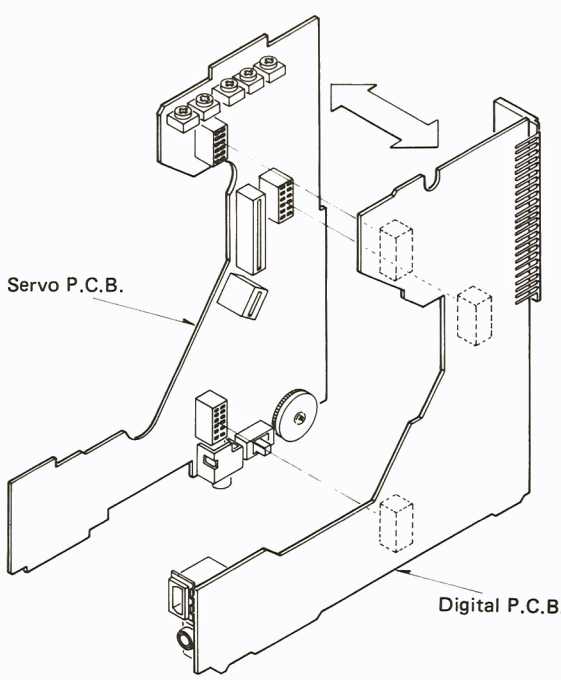
Ref. No. 3	How to remove the P.C.B. (Digital P.C.B. and servo P.C.B.)
Procedure 1➡2➡3	

Note:
Before removing the P.C.B., refer to the "pickup position for removal P.C.B." on page 12.

1. Remove the 3 setscrews of P.C.B. and pull out the connector (CN106).
2. Remove the FPC.
3. Remove the P.C.B. by steps 1 and 2.

Caution:
Fit the shorting pin to the FPC of optical pickup. (Refer to "cautions for handling optical pickup" on page 8.)





How to separate the digital and servo P.C.B.

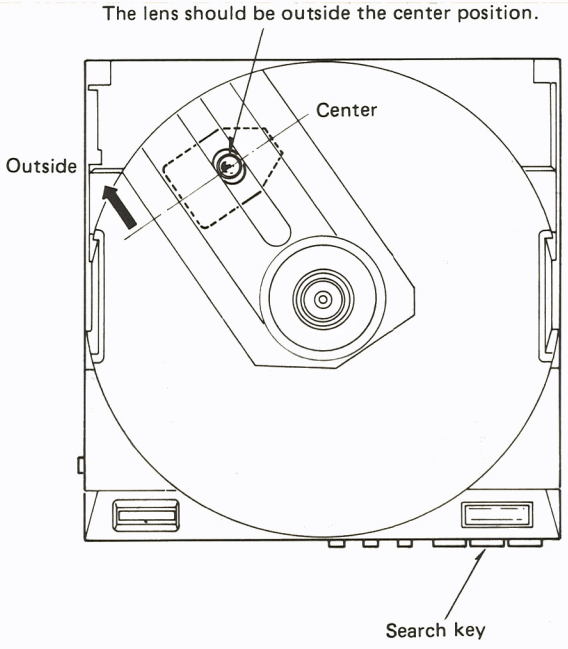
- Saparate the P.C.B. playing attention to the 3 connectors.

Note: Make sure that the 3 connectors are completely connected.

Pickup position for removal of P.C.B.

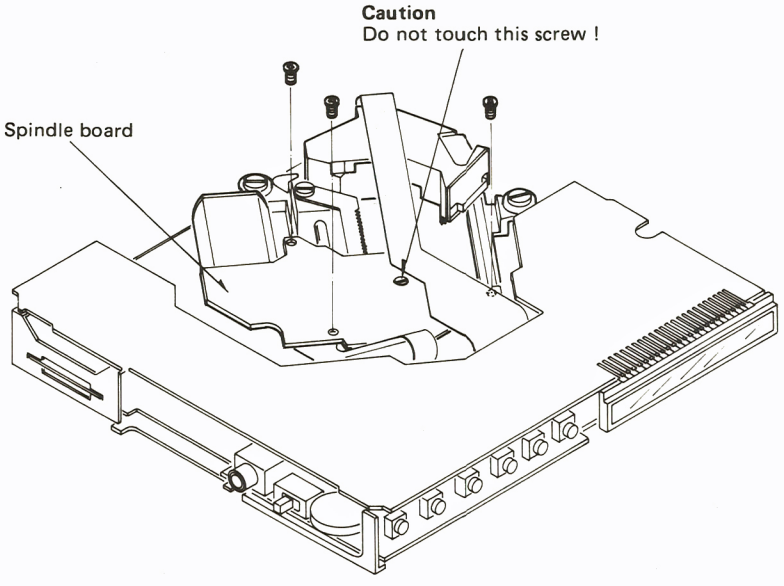
When removing the P.C.B. as a block, the rack gear will touch the P.C.B. if the optical pickup is located inside the center position. When removing the P.C.B., shift the optical pickup toward the outside as shown below.

- Put on a disc before disassembly, and move the pickup by using the search key, then turn off the power switch.

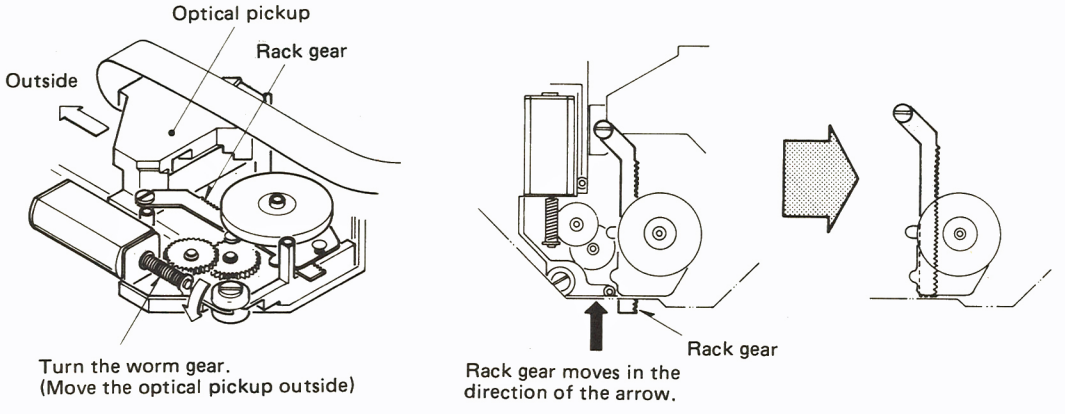


- **If the set does not operate.**

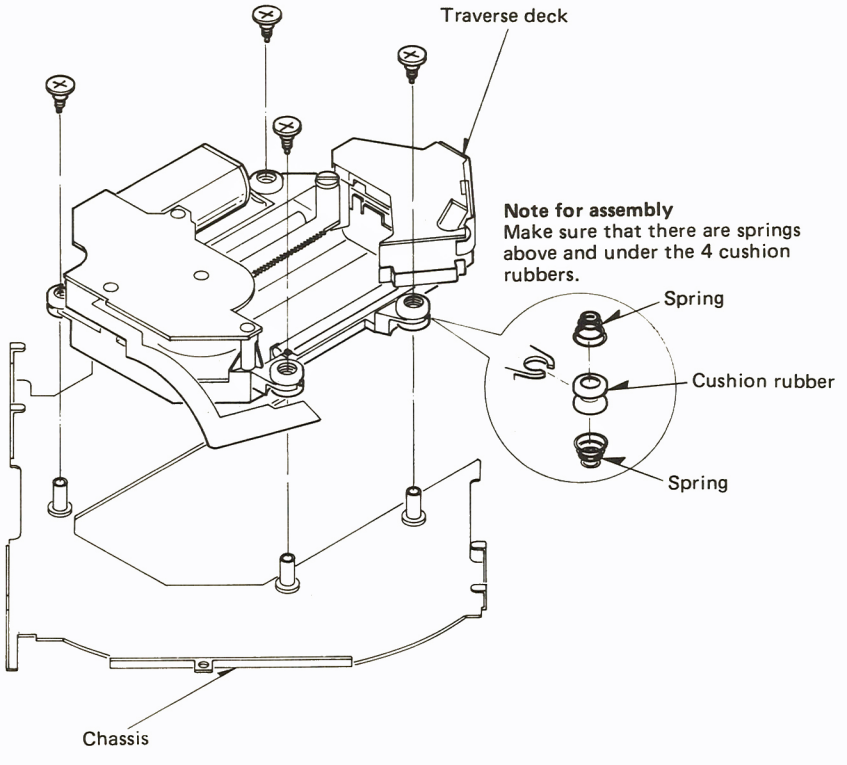
1. Remove the bottom plate.
2. Remove the 3 setscrews of spindle board.



3. Turn the worm gear until the rack gear does not come in touch with P.C.B.



Ref. No. 4	How to remove the traverse deck
Procedure 1➡2➡3➡4	• Remove the 4 setscrews of traverse deck.



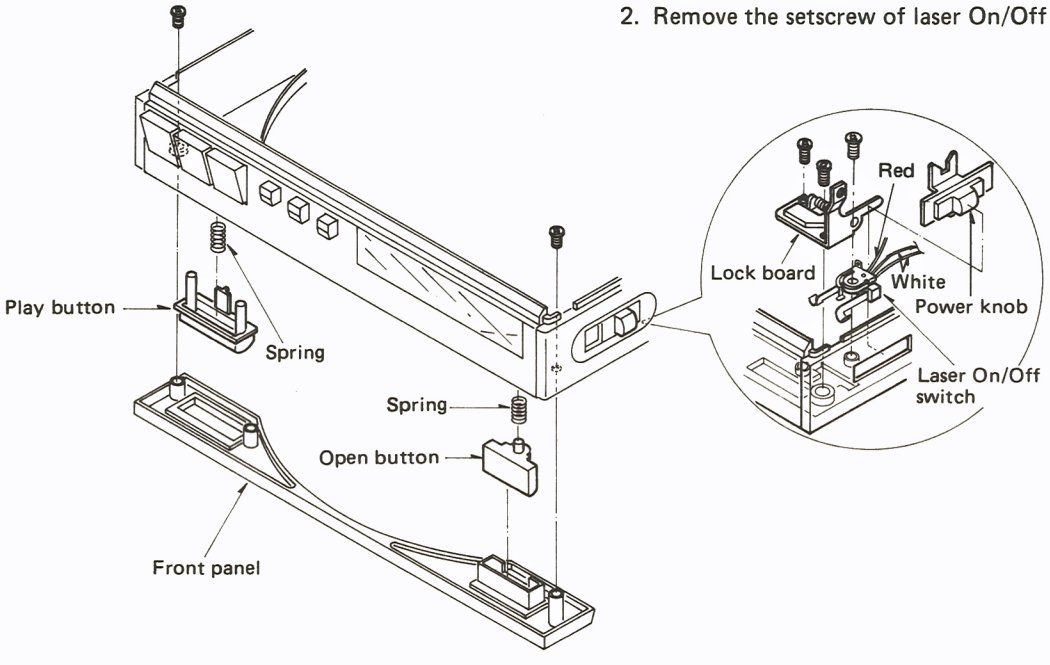
Ref. No. 5	How to remove each buttons
Procedure 1➡2➡5	

How to remove the open button and play button

- Remove the 2 setscrews of front panel.

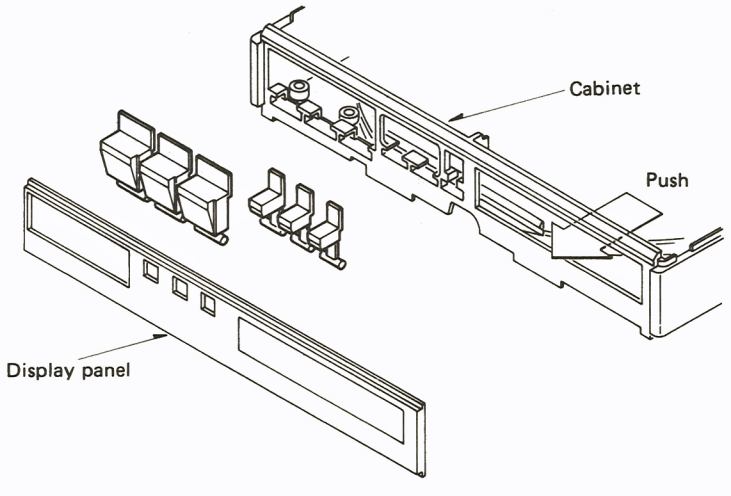
How to remove the laser On/Off switch

1. Remove the 2 setscrews of lock board.
2. Remove the setscrew of laser On/Off switch.



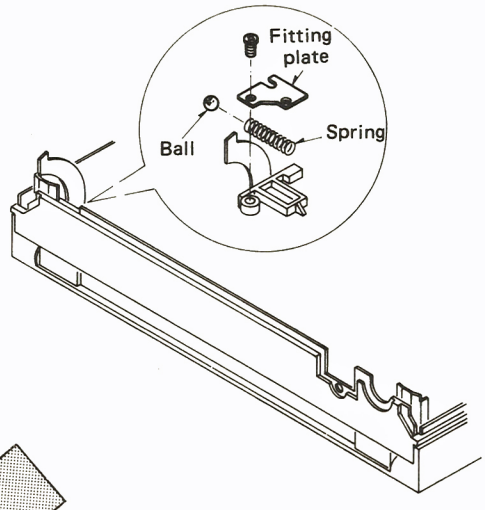
How to remove the operation buttons

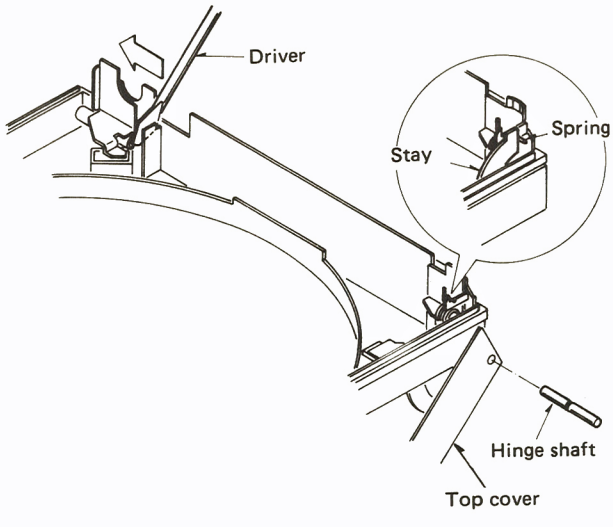
1. Push the arrow-marked part to remove the display panel.
2. Remove the buttons from cabinet.



Ref. No. 6	How to remove the top cover
Procedure 1➡2➡6	

1. Remove the spring fitting plate setscrew with the top cover.
2. Remove the spring and ball.
3. Push the key to open the top cover.
4. Push the hinge shaft with a screwdriver to remove the shaft (right and left).

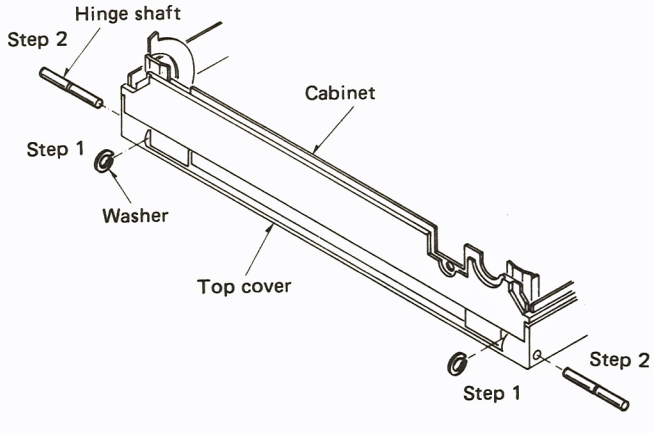




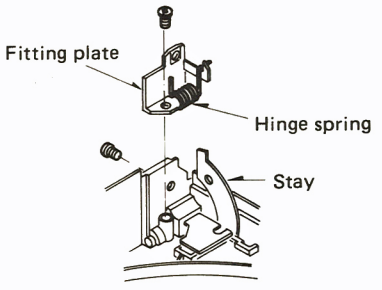
Note for assembly
With disc holder fitted and closed, the spring should be set on the stay.

Assembly method

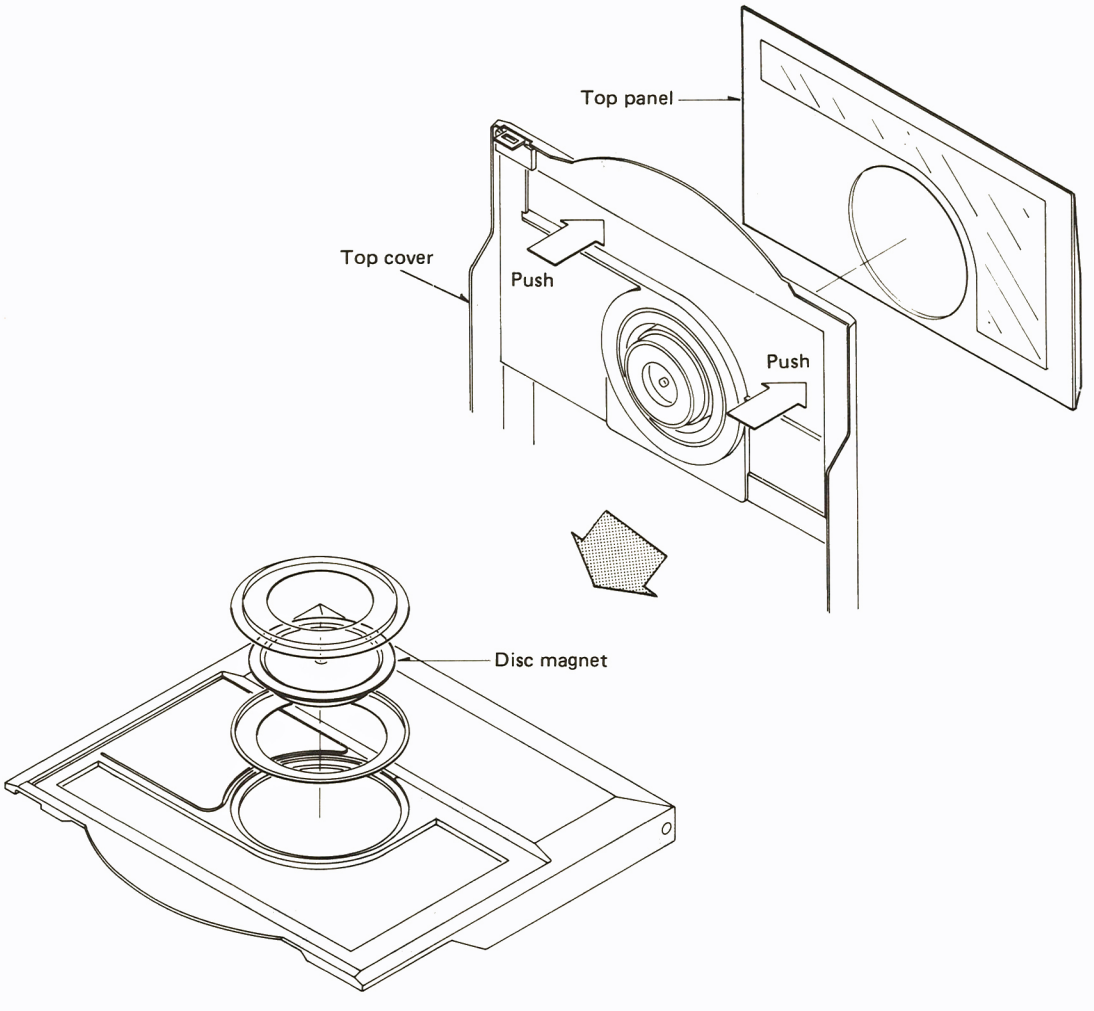
1. Combine the cabinet with top cover.
2. Insert the washer into the clearance and do the alignment. (step 1)
3. Insert the shaft. (step 2)



Ref. No. 7	How to remove the hinge spring
Procedure 1➡2➡7	• Remove the 2 setscrews of fitting plate.

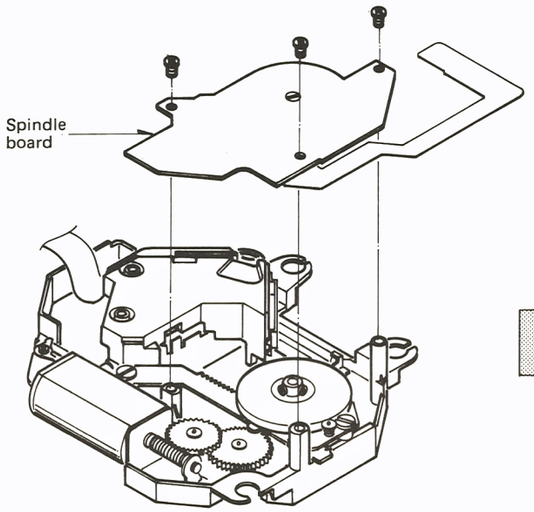


Ref. No. 8	How to remove the disc magnet
Procedure 8	1. Push the key to open the top cover. 2. Push the arrow-marked part to remove the top panel.

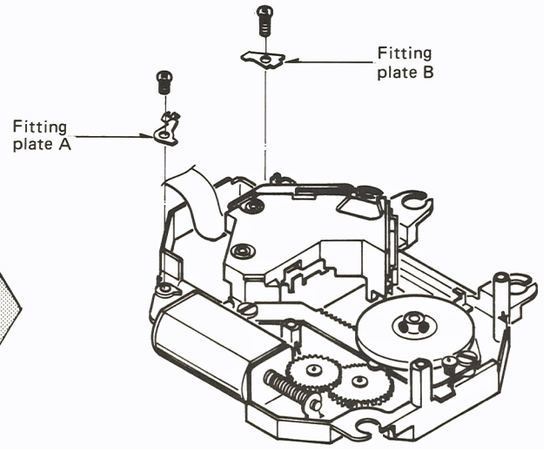


Ref. No. 9	How to remove the optical pickup
Procedure 1➡2➡3➡4➡9	

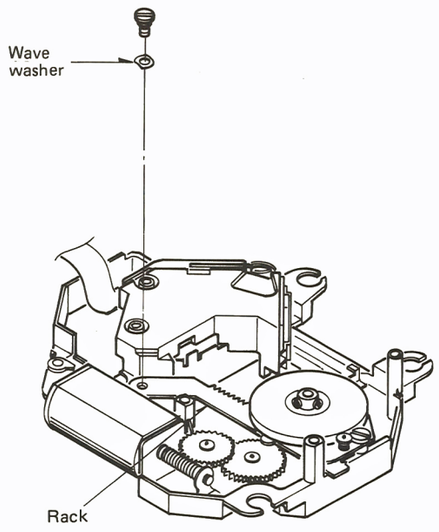
1. Remove the 3 setscrews of the spindle board.



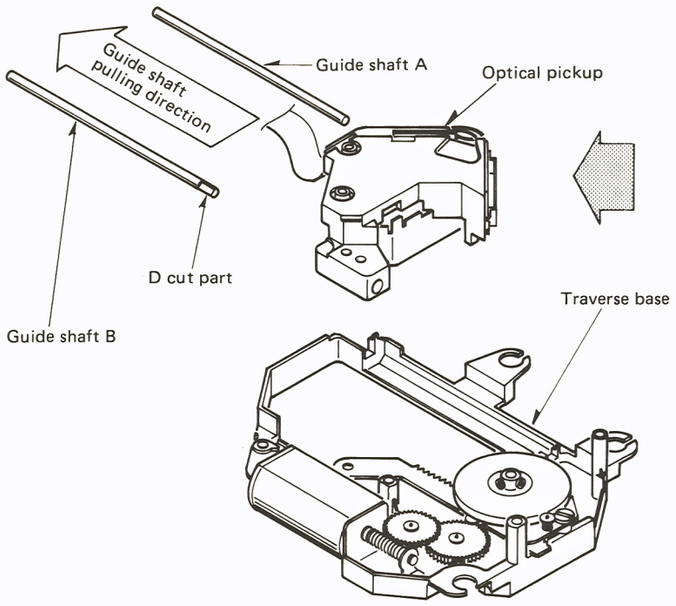
2. Remove the 2 setscrews of the guide shaft fitting plate A and B.



3. Remove the rack setscrew.
Note: Take care not to lose the wave washer.



4. Pull out the guide axes A and B in the direction of the arrow.

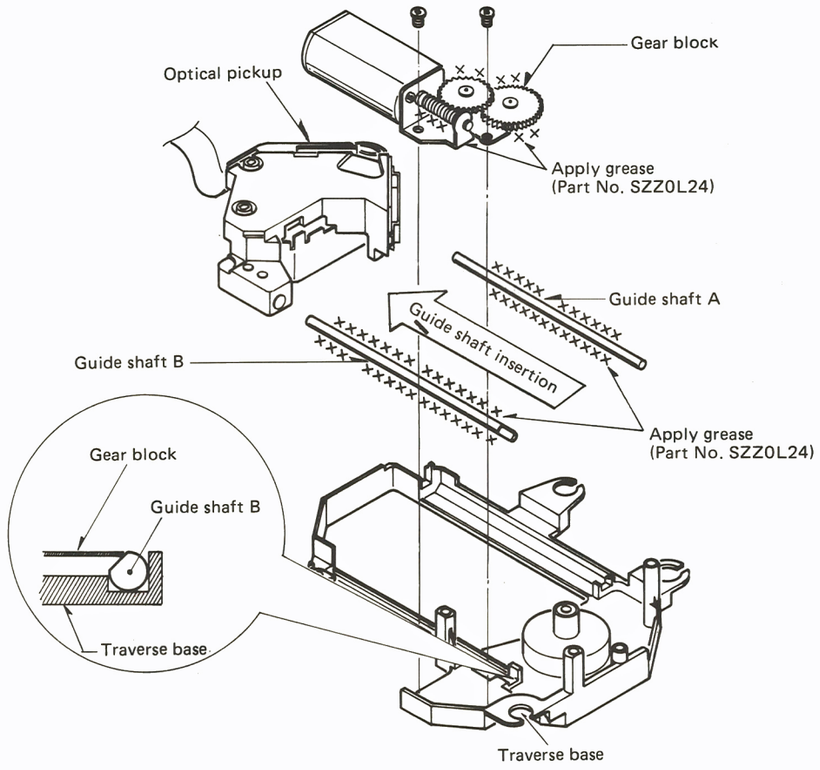


Cautions for assembly

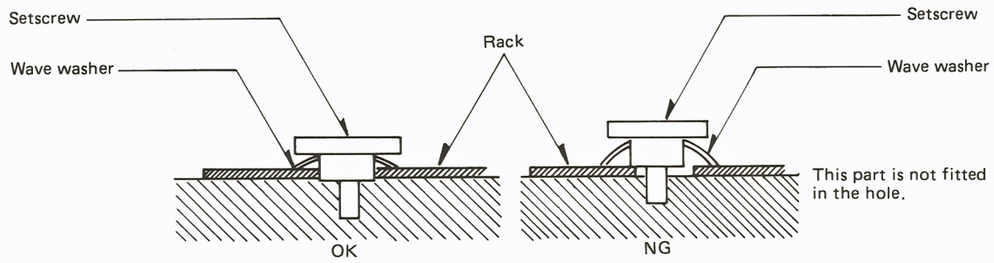
The assembly work can be done by reversing the disassembly procedure. Keep the following points in mind.

1. Be sure to insert the guide shaft in the direction of the arrow.
   If it is inserted in the wrong direction, the interval plate spring may be damaged.

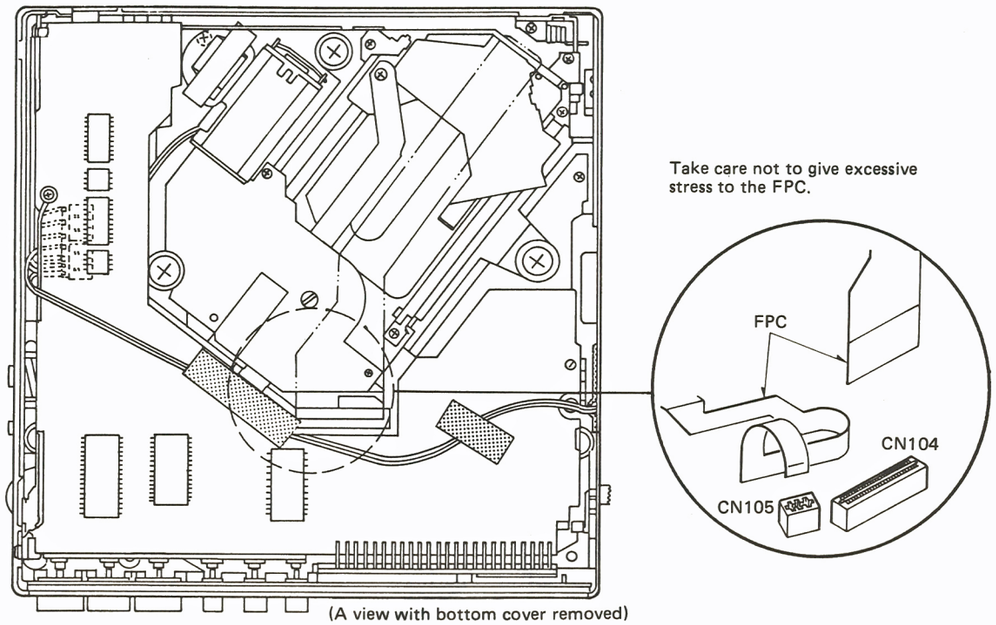
2. Make sure that the D cut off guide shaft B is fitted in the position as shown.



3. Tighten the rack setscrew as shown.



■ WIRING DIAGRAM



(A view with bottom cover removed)

■ HOW TO REPLACE CHIPS

(Resistor, capacitor and jumper)

- **Removing procedure**

1. Completely remove the solder from both ends of the chip by use of solder sucker.
2. Touch the soldering iron to the end of the chip as shown in Fig. 1, then turn the tweezers in the direction of the arrow.

Chip resistor

Do not re-use chip resistor or capacitor without color cord.

- **Replacing procedure**

1. Place solder on the foil where the chip is fitted.
   Then solder the chip by holding the soldering iron as shown in Fig. 2.

Note:

1. If the chip jumper is removed, connect a coated lead wire to the part. (See Fig. 3).
   Chip jumper is marked with "J" on the printed circuit board.

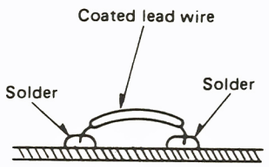


Fig. 3

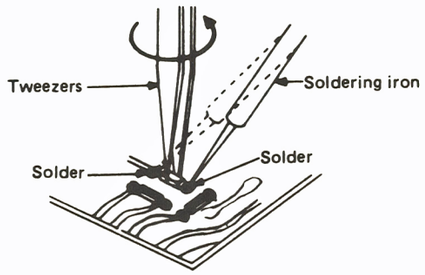


Fig. 1

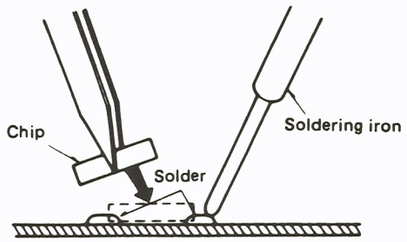
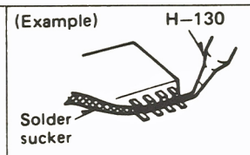
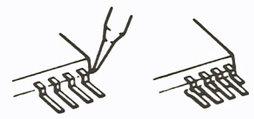


Fig. 2

- **Note for replacing chips**

1. Do not heat the chip more than 3 seconds.
2. Do not rub the electrode against the chip.
3. Use the tweezers with care not to damage the surface of the chip.
4. It is desirable to use a pencil type soldering iron. And use soldering iron less than 60W.

■ HOW TO REPLACE IC'S (Small outline type)

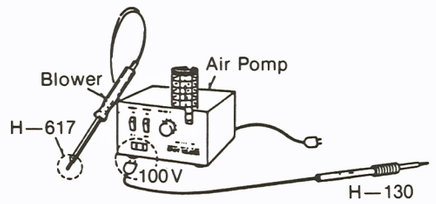
	Replacing procedure		Cautions
1	Reduce the amount of solder on each pin of the integrated circuit by use of a solder sucker.	(Example) H—130 	● **Recommended tool** .....Special soldering iron *H605M and H—130. *H605E and H—130. ● Do not touch the soldering iron to the area for a long time. It may otherwise cause removal of the print foil. ● When shifting the pin upward, do the job quickly while the solder is melting. If the solder is hard, it may cause removal or breakage of the print foil. ● When using a pencil type soldering iron. 1. Completely remove the solder from each IC pin by use of solder sucker. 2. Raise each pin by means of an eyeleteer, hold the pliers then remove IC package from P.C.B.
2	Melt the solder on the pin (one electrode) with the soldering iron.		
3	While the solder is melting, shift the pin upward by the soldering iron to remove it from the foil.		
4	Remove each pin from the foil according to the above-mentioned procedure.		

*** Special soldering iron**
(Refer to Technical Information, ORDER NO. GAD84125486T1)...For U.S.A. and Canada
(Refer to Technical Information, ORDER NO. GAD84115476T8)...For others

- **H–605 Spot Heater (hot-air solder iron)**

This device that uses hot air to melt solder was developed to remove Flat-Pakage ICs, RHCs and chip parts.

- H—605M (For 120V power source)
- H—605E (For 200V/220V/240V power source)



- **H–617 Twin Nozzle (for spot heater)**

Special nozzle for the removal of RHCs and chip resistors.
(Nozzle diameter : 1.0 mm x 2)

- **H–130 Slim Pencil Solder Iron**

An ultrasmall ceramic heater solder iron is extremely handy for soldering chip parts, RHCs, ICs, etc., to high-density circuit boards.
Features:

- Rated power: 100V, 15W
- Max. temp.: 400°C
- Heater: ceramic (long life)
- Insulation resistance: 100MΩ
- Length: 178 mm
- Weight: 16 g (not including cord)

- **H–131, H–V13 Cap Bits**

Solder tip for the slim pencil Solder Iron and is composed of a bit holder and a corrosion resistance solder tip.
Permits changing of solder tips even while still hot.

- Solder tip: 0.3 mm

■ RESISTORS AND CAPACITORS

Notes: 1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
3. The " S " mark is service standard parts and may differ from production parts.
4. Unless otherwise specified. All resistors are in OHMS (Ω) K = 1000Ω, M = 1000kΩ All capacitors are in MICORFARADS (μF) P = 10^{-6} μF.

Numbering System of Resistor

Example

ERJ	6	GMY	J	102	[ ]
Type	Wattage (1/16W)	Sharpe	Tolerance (± 5%)	Value (1kΩ)	Special use

Type	Wattage	Tolerance
ERJ : Chip Type Carbon	6 : 1/16W 8 : 1/8W	J : ± 5% K : ± 10%

Numbering System of Capacitor

Example

ECUV	1H	102	K	C
Type	Voltage (50V)	Value (0.001μF)	Tolerance (± 10%)	Peculiarity

ECEA	0G	KS	470	L
Type	Voltage (4V DC)	Peculiarity use	Value (47μF)	Special use

GR426	B	273	K	25
Type	Peculiarity	Value (0.027μF)	Tolerance (± 10%)	Voltage (25V)

Type	Voltage	Tolerance
ECEA : Electrolytic ECEA...N : Non-Polar Electroltyic ECEV...N : Chip type Non-Polar Electrolytic ECSE : Chip Type Tontal ECUV, ECUX, RCUX, REUV, GR426, GR40 : Chip Type Ceramic RCBS : Ceramic (Axial Type)	**ECEA, ECSE, ECEV Types** 0G : 4V 0J : 6.3V 1A : 10V 1C : 16V 1E : 25V 1V : 35V 1H : 50V **Others** 1E : 25V DC 1H : 50V DC 50 : 50V DC	F : ± 1pF J : ± 5% K : ± 10% M : ± 20% Z : +80 −20%

• Indication of RCBS type capacitor (Axial type)

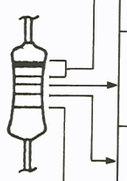
• Rated voltage

The rated voltages are indicated by insulating paint colors.

Rated voltage (DC)	Paint color
16V	Pink
50V	Light-green

• Electrostatic capacity and characteristics

The nominal electrostatic capacites (PF), tolerances and temperature characteristics are indicated by color codes.



Color band	Brown	Red	Orange	Yellow	Green	Blue	Purple	Gray	White	Black	Gold	Silver
1st, 2nd color bands (Effective number of nominal electrostatic capacity)	1	2	3	4	5	6	7	8	9	0	—	—
3rd color band (Multiplier of nominal electrostatic capacity)	10^1	10^2	10^3	10^4	—	—	—	—	—	10^0	10^{-1}	10^{-2}
4th color band (Tolerances)	—	—	—	—	—	—	—	N	Z	M	J	K
5th color band (Temperature characteristic)												

• RESISTORS

Ref. No.	Part No.	Value
R101, 102	ERJ6GMYJ102M	1K
R103	ERJ6GMYJ822M	8.2K
R104	ERJ6GMYJ682M	6.8K
R105, 106	ERJ6GMYJ222M	2.2K
R107	ERJ6GMYJ682M	6.8K
R108	ERJ6GMYJ822M	8.2K
R109	ERJ6GMYJ154M	150K
R110, 111	ERJ6GMYJ222M	2.2K
R112	ERJ8GCYJ100M	10
R113, 114	ERJ6GMYJ333M	33K
R115	ERJ6GMYJ561M	560
R116	ERJ6GMYJ102M	1K
R117	ERJ6GMYJ223M	22K
R119	ERJ6GMYJ153M	15K
R120	ERJ6GMYJ272M	2.7K
R121	ERJ6GMYJ154M	150K
R125	ERJ6GMYJ561M	560
R126	ERJ6GMYJ333M	33K
R127	ERJ6GMYJ104M	100K
R128	ERJ6GMYJ333M	33K
R129	ERJ6GMYJ102M	1K
R130	ERJ6GMYJ153M	15K
R131	ERJ6GMYJ682M	6.8K
R134	ERJ6GMYJ681M	680
R135	ERJ6GMYJ472M	4.7K
R136	ERJ6GMYJ151M	150
R137	ERJ8GCYJ270M	27
R138	ERJ8GCPK1R0M	1
R140	ERJ6GMYJ681M	680
R141	ERJ6GMYJ151M	150

Ref. No.	Part No.	Value
R142	ERJ8GCYJ270M	27
R143	ERJ8GCPK1R0M	1
R144	ERJ6GMYJ473M	47K
R147	ERJ6GMYJ681M	680
R150, 151	ERJ6GMYJ102M	1K
R156	ERJ6GMYJ683M	68K
R204, 205	ERJ6GMYJ472M	4.7K
R206	ERJ6GMYJ124M	120K
R207, 208	ERJ6GMYJ223M	22K
R209	ERJ6GMYJ333M	33K
R210	ERJ6GMYJ104M	100K
R211	ERJ6GMYJ124M	120K
R212	ERJ6GMYJ123M	12K
R213	ERJ6GMYJ103M	10K
R221	ERJ6GMYJ823M	82K
R222	ERJ6GMYJ224M	220K
R224	ERJ6GMYJ823M	82K
R225	ERJ6GMYJ224M	220K
R227, 228	ERJ6GMYJ472M	4.7K
R229	ERJ6GMYJ823M	82K
R301	ERJ6GMYJ562M	5.6K
R302	ERJ6GMYJ474M	470K
R303	ERJ6GMYJ132M	1.3K
R304	ERJ6GMYJ333M	33K
R305	ERJ6GMYJ221M	220
R306	ERJ6GMYJ224M	220K
R401, 402	ERJ6GMYJ222M	2.2K
R403	ERJ6GMYJ222M	2.2K
R405, 406	ERJ6GMYJ102M	1K
R407	ERJ6GMYJ102M	1K

Ref. No.	Part No.	Value
R408	ERJ6GMYJ333M	33K
R409, 410	ERJ6GMYJ472M	4.7K
R411, 412	ERJ6GMYJ472M	4.7K
R413, 414	ERJ6GMYJ472M	4.7K
R415, 416	ERJ6GMYJ473M	47K
R418, 419	ERJ6GMYJ183M	18K
R501	ERJ6GEYJ561V	560
R502	ERJ6GEYJ152V	1.5K
R503	ERJ6GEYJ223V	22K
R504, 505	ERJ6GEYJ330V	33
R506	ERJ6GEYJ680V	68
R507	ERJ8GEYJ1R2V	1.2
R601, 602	ERJ6GMYJ473M	47K
R603	ERJ6GMYJ333M	33K
R604	ERJ6GMYJ103M	10K
R605	ERJ6GMYJ153M	15K
R606	ERJ6GMYJ472M	4.7K
R609	ERJ6GMYJ561M	560
R701, 702	ERJ6GMYJ472M	4.7K
R703	ERJ8GCYJ471M	470
R704	ERJ6GMYJ332M	3.3K
R705	ERJ6GMYJ562M	5.6K
R707	ERJ6GMYJ332M	3.3K
R710	ERJ6GMYJ391M	390
R712	ERJ6GMYJ222M	2.2K
R713	ERJ6GMYJ472M	4.7K
R714	ERJ6GMYJ222M	2.2K
R719, 720	ERJ6GMYJ472M	4.7K
R731	ERJ6GMYJ221M	220
R732	ERJ6GMYJ103M	10K

Ref. No.	Part No.	Value
R733	ERJ6GMYJ332M	3.3K
R734	ERJ6GMYJ562M	5.6K
R735	ERJ6GMYJ102M	1K
R736, 737	ERJ6GMYJ472M	4.7K
R738	ERJ6GMYJ332M	3.3K
R739	ERJ6GMYJ153M	15K
R801, 802	ERJ6GMYJ4R7M	4.7
R806, 807	ERJ6GMYJ332M	3.3K
R810, 811	ERJ6GMYJ152M	1.5K
R813	ERJ6GMYJ221M	220
R814, 815	ERJ6GMYJ102M	1K
R816	ERJ6GMYJ221M	220
R817	ERJ6GMYJ223V	22K
R818	ERJ6GMYJ103V	10K
R819	ERJ6GMYJ272V	2.7K
R820	ERJ6GMYJ472V	4.7K
R824, 825	ERJ6GMYJ221M	220
R826, 827	ERJ6GMYJ222M	2.2K
R828	ERJ6GMYJ472M	4.7K
R829	ERJ6GMYJ472M	4.7K
R903, 904	ERJ6GMYJ104M	100K
R907, 908	ERJ8GCYJ680M	68
R909	ERJ6GMYJ123M	12K
R910	ERJ6GMYJ332M	3.3K
R911	ERJ6GMYJ123M	12K
R912	ERJ6GMYJ332M	3.3K

• CAPACITORS

Ref. No.	Part No.	Value
C102	RCUX1H222KB	0.0022
C103, 104	ECUV1H102KC	0.001
C105	ECUX1H681KC	680P
C106, 107	ECUV1H102KC	0.001
C108	ECSF0GE476	47
C109	RCUX1H220KC	22P
C110	ECUX1H103KB	0.01
C111	ECUX1H681KC	680P
C112	RCUV1E104ZF	0.1
C113	ECUX1E223MB	0.022
C114	ECEA1HSN010L	1
C115, 116	RCUV1E104ZF	0.1
C117	ECUX1H681KC	680P
C118	ECEA0JSN220I	22
C119	ECEA1HKS010L	1
C120	RCUV1H471KC	470P
C121	ECUX1E333KB	0.033
C122	RCUV1H682KB	0.0068
C123	RCUX1H182KB	0.0018
C124	ECEA1HKSR33L	0.33
C125	ECUV1E333KB	0.033
C126	ECUX1H153MB	0.015
C127	RCUX1H102KB	0.001

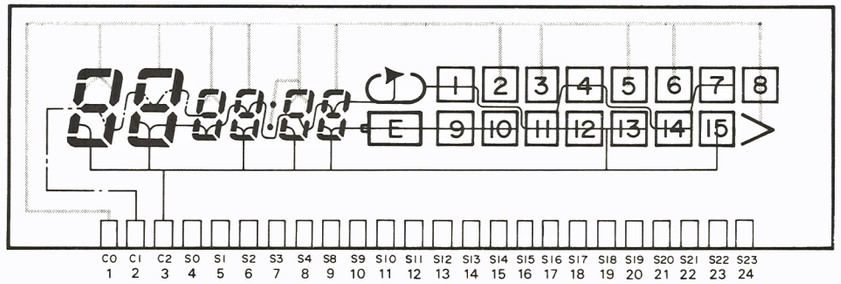
Ref. No.	Part No.	Value
C130	ECEA1ESN3R3I	3.3
C135	ECEA1ESN3R3I	3.3
C136	RCUX1H102MB	0.001
C137	ECUV1E224ZF	0.22
C138	RCUX1H472MB	0.0047
C139	RCUV1E104ZF	0.1
C140	ECUX1E223MB	0.022
C146, 147	RCUV1E104ZF	0.1
C148	RCUV1E104ZF	0.1
C150	ECEA0JKS101	100
C153, 154	RCUV1E104ZF	0.1
C155, 156	RCUX1H103ZF	0.01
C205	RCUV1E104ZF	0.1
C206	ECUX1E223MB	0.022
C207	ECEA1EKN3R3	3.3
C221, 222	ECUX1H153MB	0.015
C223	RCUX1H101KC	100P
C301	RCUV1E104ZF	0.1
C302	ECUV1E104MD	0.1
C304	ECSE0JT685SM	6.8
C306	RCUX1H150JT	15P
C307	ECUX1E333KB	0.033
C308	RCUX1H102MB	0.001

Ref. No.	Part No.	Value
C309	ECUV1E104MD	0.1
C310	ECSE1CT4740R	0.47
C311	ECEA1VSN2R2I	2.2
C312	RCUV1E153KB	0.015
C313	ECUV1E104MD	0.1
C314	RCUX1H100FC	10P
C316	ECUV1E473MD	0.047
C317	RCUV1E104ZF	0.1
C319, 320	RCUX1H681KB	680P
C401	ECSE0JT685SM	6.8
C402	RCUX1H103ZF	0.01
C501	GR426B273K25	0.027
C502, 503	ECEV1HN010R	1
C504	ECEV1EV6R8R	6.8
C505	GR426F224Z25	0.22
C506	GR426B333M25	0.033
C508	GR426F334Z25	0.33
C509, 510	GR40F104Z25P	0.1
C601, 602	RCUX1H100FC	10P
C604	RCUV1E104ZF	0.1
C605	ECUX1E223MB	0.022
C606	RCUX1H103ZF	0.01
C701	RCUV1E104ZF	0.1

Ref. No.	Part No.	Value
C703	RCUV1E104ZF	0.1
C704	ECEA0JKS470	47
C705	RCUV1E104ZF	0.1
C706, 707	RCUV1E104ZF	0.1
C708	RCUV1E104ZF	0.1
C731, 732	ECEA1AKS330I	33
C733, 734	ECEA1AKS330I	33
C735	ECEA1AKS330I	33
C806, 807	ECEA0JKS470	47
C810, 811	RCUV1H331KC	330P
C812, 813	ECEA1ASN100L	10
C819, 820	RCUV1E104ZF	0.1
C821	RCUV1E104ZF	0.1
C822	RCUX1H103ZF	0.01
C823	RCUV1E104ZF	0.1
C902, 903	RCUX1H472MB	0.0047
C904	RCUX1H103ZF	0.01
C905, 906	ECEA1AKS470	47

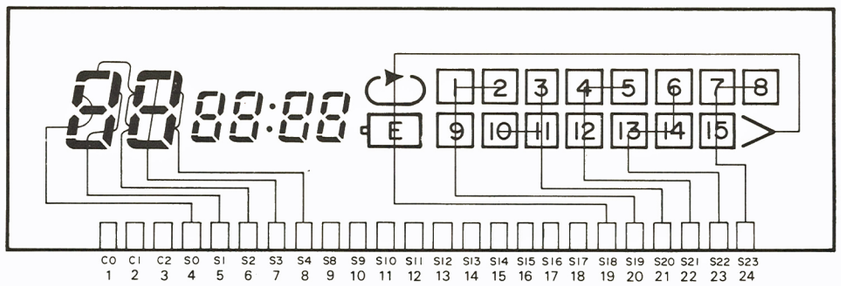
■ INTERNAL CONNECTIONS OF LCD (Liquid Crystal Display)

- **Common connection diagram**

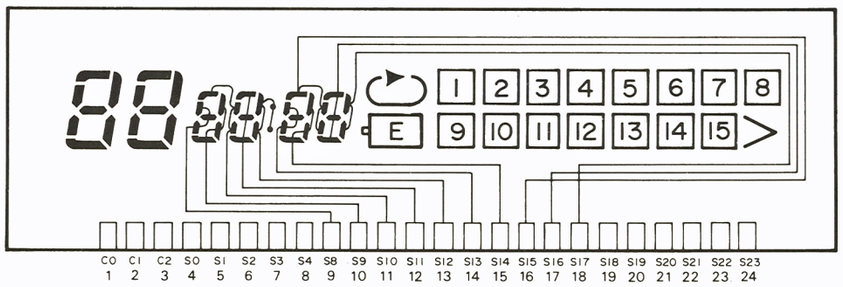


- **Segment connection diagram**

(a)



(b)



■ TERMINAL FUNCTION OF LSI

- **MN6617 (Digital Signal Processing : EFM Decoder, Error Correction, CLV Servo)**

Pin No.	Mark	I/O Devision	Function
1	BLKCK	O	Sub-code block (Q data) clock (75 Hz)
2	$\overline{\text{CLDCK}}$	O	Sub-code frame (Q data) clock (7.35 kHz)
3	$\overline{\text{SUBQ}}$	O	Sub-code (Q data) output
4	CRC	O	Sub-code (Q data) CRC check (not used, open)
5	$\overline{\text{RST}}$	I	Reset signal input (reset at "L")
6	MLD	I	Data input (Command load)
7	MCLK	I	Data clock input (Command clock)
8	MDATA	I	Data input (Command data)
9	DMUTE	I	Muting control (muting ON at "H")
10	$\overline{\text{TRON}}$	I	Tracking servo ON signal (tracking servo ON at "L")
11	STAT	O	Processing condition (CRC, OTC, CLVOK, TT STOP) output
12	SMCK	O	Clock output (4.2336 MHz)
13	PMCK	O	Pitch control clock output (not used, open)
14	ITC	I	Track counter input signal (not used, connected to +5V)
15	$\overline{\text{TEST}}$	I	Test mode selection (not used, connected to +5V)
16	X2	O	Clock output (16.9334 MHz)
17	X1	I	Clock input (16.9344 MHz)
18	SEL	I	DA output parallel/serial selection (parallel at "H")
19	LDG	O	L channel deglitch signal
20	RDG	O	R channel deglitch signal
21	DEMPH	O	De-emphasis ON signal (de-emphasis ON at "H")
22	IPFLAG	O	Interpolation flag (interpolation at "H")
23	FLAG0	O	Error flag (error at "H")
24	FLAG6	O	16 K RAM address reset signal (reset at "H")
25	XCK	O	Clock (16.9334 MHz) output (not used, open)
26 ⟆ 30	DA15 ⟆ DA11	O	16-bit data output (DA15 : MSB)
31	GND	I	GND terminal
32 ⟆ 42	DA10 ⟆ DA 0	O	16-bit data output (DA0 : LSB)
43 ⟆ 50	D7 ⟆ D0	I/O	16 K RAM data output
51	RAMOE	O	16 K RAM $\overline{\text{OE}}$ signal
52	RAMWE	O	16 K RAM $\overline{\text{WE}}$ signal
53 ⟆ 63	RAMA 0 ⟆ RAMA10	O	16 K RAM address signal (RAMA0 : LSB, RAMA10 : MSB)
64	PC	O	Spindle motor ON signal (ON at "L")
65	EC	O	Spindle motor drive signal
66	FG	I	Spindle motor FG signal input
67	——	——	————
68	——	——	————
69	——	——	————
70	——	——	————
71	——	——	————
72	PCK	I	PLL extract clock input (4.2336 MHz)
73	VDD	I	Power supply (connected to +5V)
74	EFM	I	EFM signal input (PLL)
75	SRF	I	EFM signal input (DSL)
76	DO	I	Drop-out signal (Drop-out at "H")
77	CLVS	O	11T servo OK signal (OK at "H")
78	FPC	O	PLL frequency comparision signal
79	BSSEL	O	PLL frequency in take operation signal
80	——	——	————
81	——	——	————
82	——	——	————
83	SUBC	O	Sub-code serial output data (not used, open)
84	SBCK	I	Clock for sub-code serial output (not used, connected to GND)

• AN8370S (Optical Servo Control)

Pin No.	Mark	I/O Devision	Function
1	VEE	I	Power supply (connected to –5V)
2	LSA	I	Phase difference input (A)
3	GND	I	GND terminal
4	LSB	I	Phase difference input (B)
5	APC	O	Auto laser power control output
6	TEOUT	O	Tracking error signal output
7	TEG	I	Tracking error gain adjusting input
8	TE–	I	Phase difference-voltage conversion (–)
9	TE +	I	Phase difference-voltage conversion (+)
10	APC –	O	Laser power inversion input
11	C·MEM	I	Capacitor connection for phase difference memory
12	APC +	I	Laser power non-inversion input
13	VREF	O	Reference current generation
14	SENSE	O	Selector output (track-crossed)
15	HIN	I	Tracking hold circuit input
16	HOUT	O	Tracking hold circuit output
17	SPCNT	O	Track-cross speed control output (not used, grounded)
18	C·MSP	I	Track-cross reference speed setting capacitor connection (not used, grounded)
19	C·AF	I	Auto focus timer capacitor connection
20	KICK R/$\overline{F}$	O	Track kick signal output
21	VCC	I	Power supply (connected to +5V)
22	CNT1	I	Control input ($\overline{FOON}$: Focus servo ON signal)
23	CNT2	I	Control input ($\overline{TRON}$: Tracking servo ON signal)
24	CNT3	I	Control input (KICKF : Kick direction [forward] command)
25	CNT4	I	Control input (KICKR : Kick direction [reverse] command)
26	$\overline{F·LOCK}$	O	Focus lock signal output
27	C·FBDO	O	Capacitor connection for inversion RF high speed detection
28	C·SBDO	O	Capacitor connection for inversion RF low speed detection
29	C·SBRT	O	Capacitor connection for non-inversion RF low speed detection
30	C· FBRT	O	Capacitor connection for non-inversion RF high speed detection
31	RF OUT	O	RF signal output
32	BDO	O	Drop-out detection output
33	RFIN	I	RF signal input
34	S·OUT	O	Focus search signal output
35	C·LW	I	Capacitor connection for triangular wave generation
36	FE·OUT	O	Focus error signal output
37	FEG	I	Focus error gain adjusting input
38	FE·REF	I	Focus error comparison voltage generation
39	PDB	I	Photo detector current input (B)
40	IVB	O	Current/voltage conversion output (B)
41	IVA	O	Current/voltage conversion output (A)
42	PDA	I	Photo detector current input (A)

• AN8371S (Data Slice and PLL)

Pin No.	Mark	I/O Devision	Function
1	VEE	I	Power supply (connected to –5V)
2	SRF	O	RF signal output data-sliced into digital value
3	EFM	O	EFM signal output synchronized with PCK
4	D·GND	I	GND terminal (digital system)
5	PCK	O	Clock output extracted from SRF
6	VCC	I	Power supply (connected to +5V)
7	VA	I	VCO free ran frequency adjusting current input
8	VC1	I	Capacitor connection for VCO oscillation frequency
9	VC2	I	Capacitor connection for VCO oscillation frequency
10	VR	I	Resistor connection for VCO oscillation frequency
11	PD	I	Capacitor connection for PLL DO protection
12	PL1	I	PLL loop filter constant connection
13	PL2	I	PLL loop filter constant connection
14	FPC	I	Frequency comparison error signal input.
15	RF	I	RF signal input
16	ARF	O	RF signal output with AGC applied
17	AGC	I	ARF signal input for AGF drop-out detection
18	AC	I	AGC loop filter constant connection
19	DO	O	Drop-out detection pulse output
20	A·GND	I	GND terminal (analog system)
21	DSL	I	RF signal input for data slicer
22	SLC	I	Slice level control signal input
23	FC1	I	Data slicer filter capacitor connection
24	FC2	I	Data slicer filter capacitor connection

• MN15845PDA (System Control)

Pin No.	Mark	Signal	I/O Devision	Function
1	VDD	VDD	I	Power supply (connected to +5V)
2	OSC1	OSC	I	Clock input (4.2336 MHz)
3	OSC 2	——	O	Not used (open)
4	X1	TCNT	I	Track count input (track-cross input in rough search)
5	X0	——	O	Not used (open)
6	$\overline{RST}$	$\overline{RESET}$	I	Reset signal input (reset at "L")
7	$\overline{SYNC}$	——	O	Not used (open)
8	$\overline{IRQ}$	BLKCK	I	Q data read-in timing strobe signal input (sub-code block clock : 75 Hz)
9	$\overline{SIRQ}$	——	I	Not used. (connected to VDD)
10	$\overline{SBI}$	$\overline{SUBQ}$	I	Q data read-in input (sub-code Q code)
11	$\overline{SBO}$	——	O	Not used (open)
12	$\overline{SBT}$	$\overline{CLDCK}$	I	Q data read-in data strobe signal input (sub-code block clock : 7.35 kHz)
13 ~ 16	P40 ~ P43	——	I	Key input
17	P00	MCLK	I/O	Key input strobe and data clock output
18	P01	MDATA	I/O	Key input strobe and data output
19	P02	$\overline{TEST}$	I/O	Key input strobe and tracking error read-in strobe output
20	P03	MLD	O	Data strobe signal output (signal processing LSI command load output)
21	P10	$\overline{SENSE}$	I	Optical servo status (track-cross) input
22	P11	$\overline{FLOCK}$	I	Optical servo status (focus) input.
23	P12	TEDET	I	Traverse tracking error detection signal input
24	P13	STAT	I	Processing status input from signal processing LSI
25	P20	CNT4	O	Optical servo IC control signal (KICKR : Kick direction [revers] command)
26	P21	CNT3	O	Optical servo IC control signal (KICKF : Kick direction [forward] command)
27	P22	CNT2	O	Optical servo IC control signal ($\overline{TRON}$: Track servo)
28	P23	CNT1	O	Optical servo IC control signal ($\overline{FOON}$: Focus servo)
29	P30	POWER	O	Power save control (power save at "H")
30	P31	TRFWD	O	Traverse motor forward command signal
31	P32	TRREV	O	Traverse motor revers command signal
32	P33	MUTE	O	Muting control (muting ON at "H")
33	VLCD 1	——	I	LCD drive power supply (3.33V)
34	VLCD2	——	I	LCD drive power supply (1.67V)
35	VLCD3	——	I	LCD drive power supply (0V)
36 ~ 38	COM0 ~ COM2	——	O	LCD common line output
39	COM3	——	O	Not used (open)
40 ~ 44	SEG0 ~ SEG4	——	O	LCD segment line output
45 ~ 47	SEG5 ~ SEG7	——	O	Not used (open)
48 ~ 63	SEG8 ~ SEG23	——	O	LCD segment line output
64	VSS	GND	I	GND terminal.

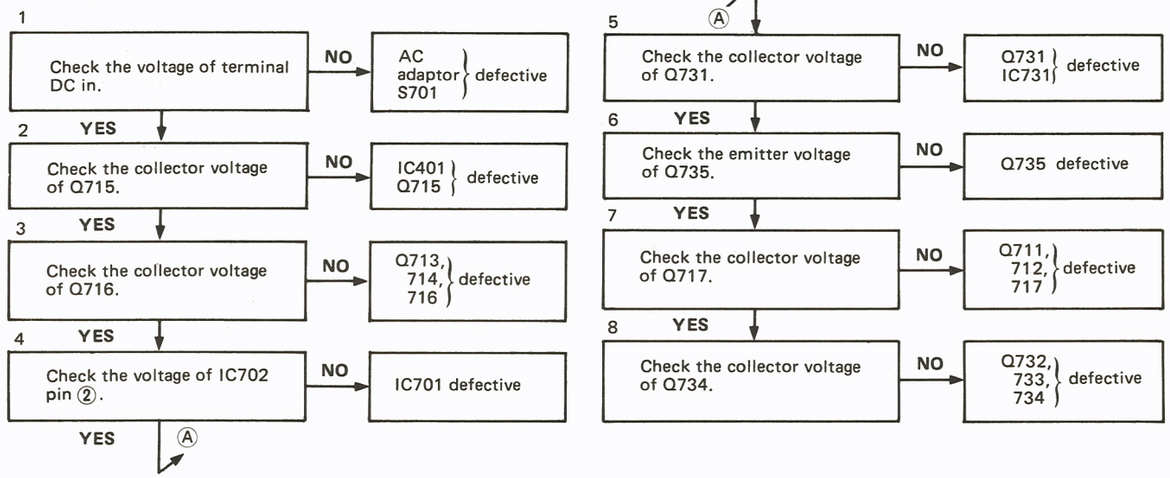
• AN8281S (Spindle Motor Drive)

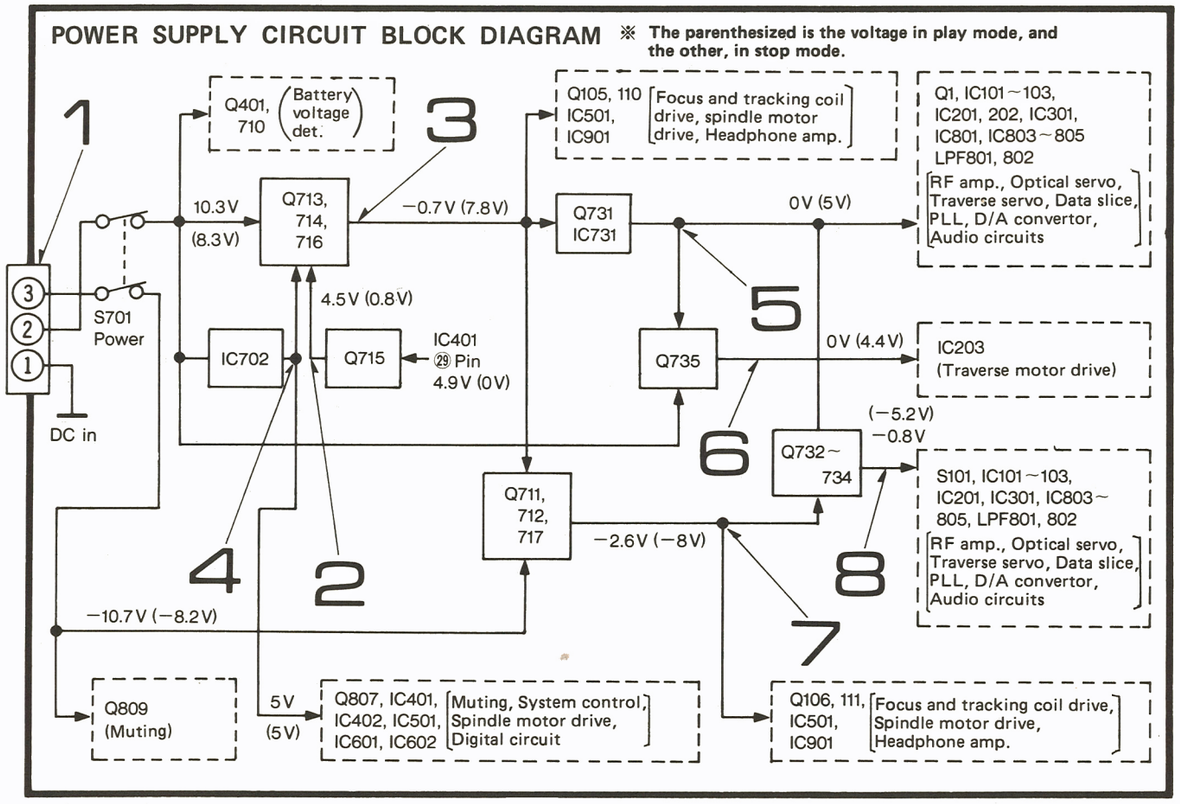
Pin No.	Mark	I/O Devision	Function
1	PG	I	GND terminal (for power supply)
2	SG	I	GND terminal (for signal)
3	HB	O	Hall element bias voltage output (7.5V)
4	DCR	I	Reference voltage input (2.5V)
5	NC	——	Not used.
6	FAO	O	Loop filter constant connection
7	NC	——	Not used.
8	FAI	I	Loop filter constant connection and control signal input
9	H2 –	I	Hall element's Hall voltage input (inversion)
10	H2 +	I	Hall element's Hall voltage input (non-inversion)
11	H1 –	I	Hall element's Hall voltage input (inversion)
12	H1 +	I	Hall element's Hall voltage input (non-inversion)
13	FGP	O	FG pulse output.
14	VCC	I	Power supply (connected to +7.5V)
15	PC	I	Capacitor connection for phase compensation and motor drive command input.
16	CS	O	Current detection
17	B1	O	Spindle motor drive output
18	B1b		
19	B2b		
20	B2		
21	A2		
22	A2b		
23	A1b		
24	A1		

■ TROUBLESHOOTING

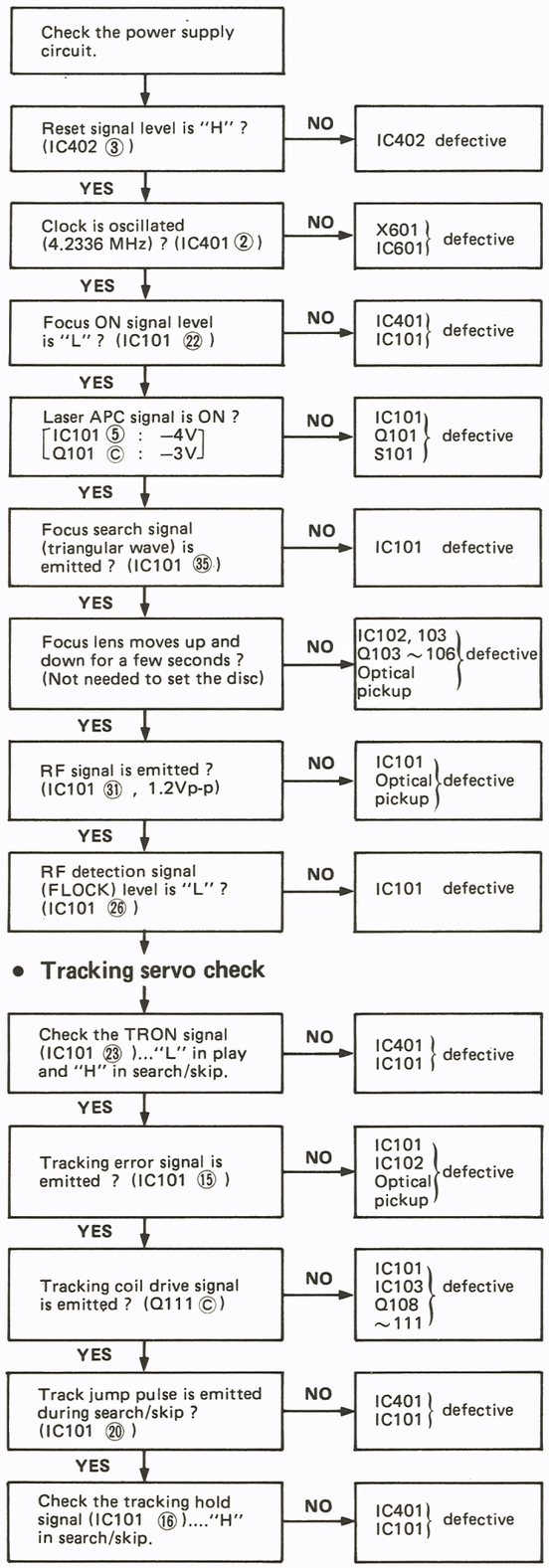
Note: 1. Carefully handle the compact disc because stain, dust or warping may cause generation of noise.
2. If the optical pickup lens is stained, it may sometime cause sound skip of failure of performance. **Refer to "CLEANNING OF LENS (page 8)".**
3. For the voltage value and waveform, refer to the schematic diagram.
(The voltage value and waveform slightly varies depending on the measuring set and power supply.)
4. Possible defects are mainly shown by the name of semi-conductor. The adjacent electronic circuits (such as C and R) are omitted.

• Check the power supply circuit



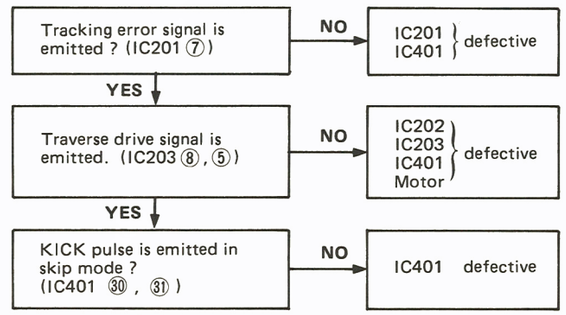


• Focus servo check

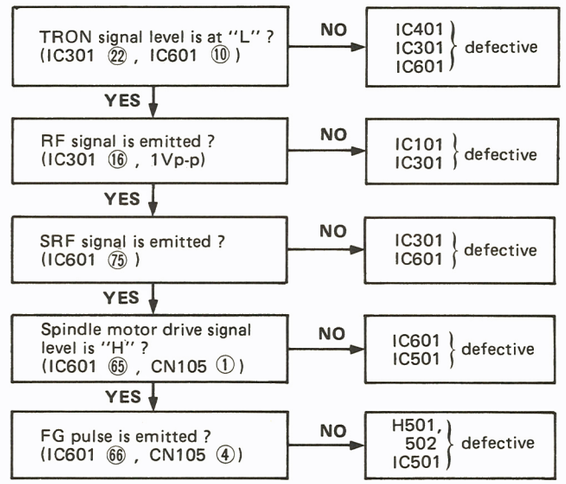


• Tracking servo check

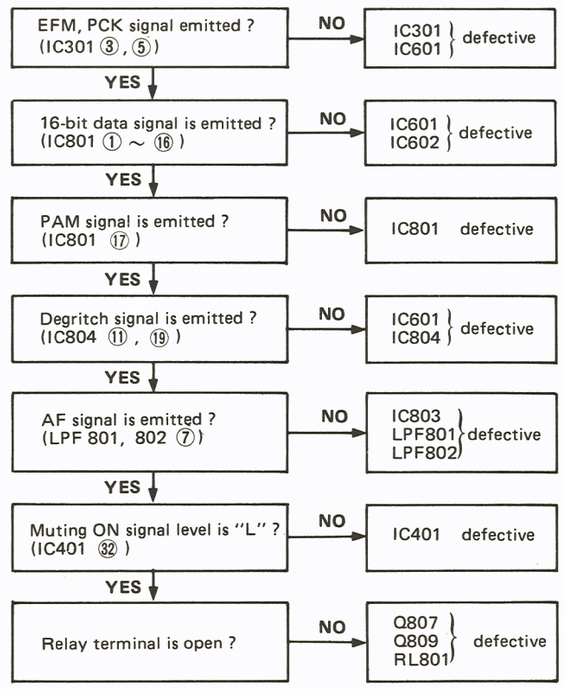
• Traverse servo check



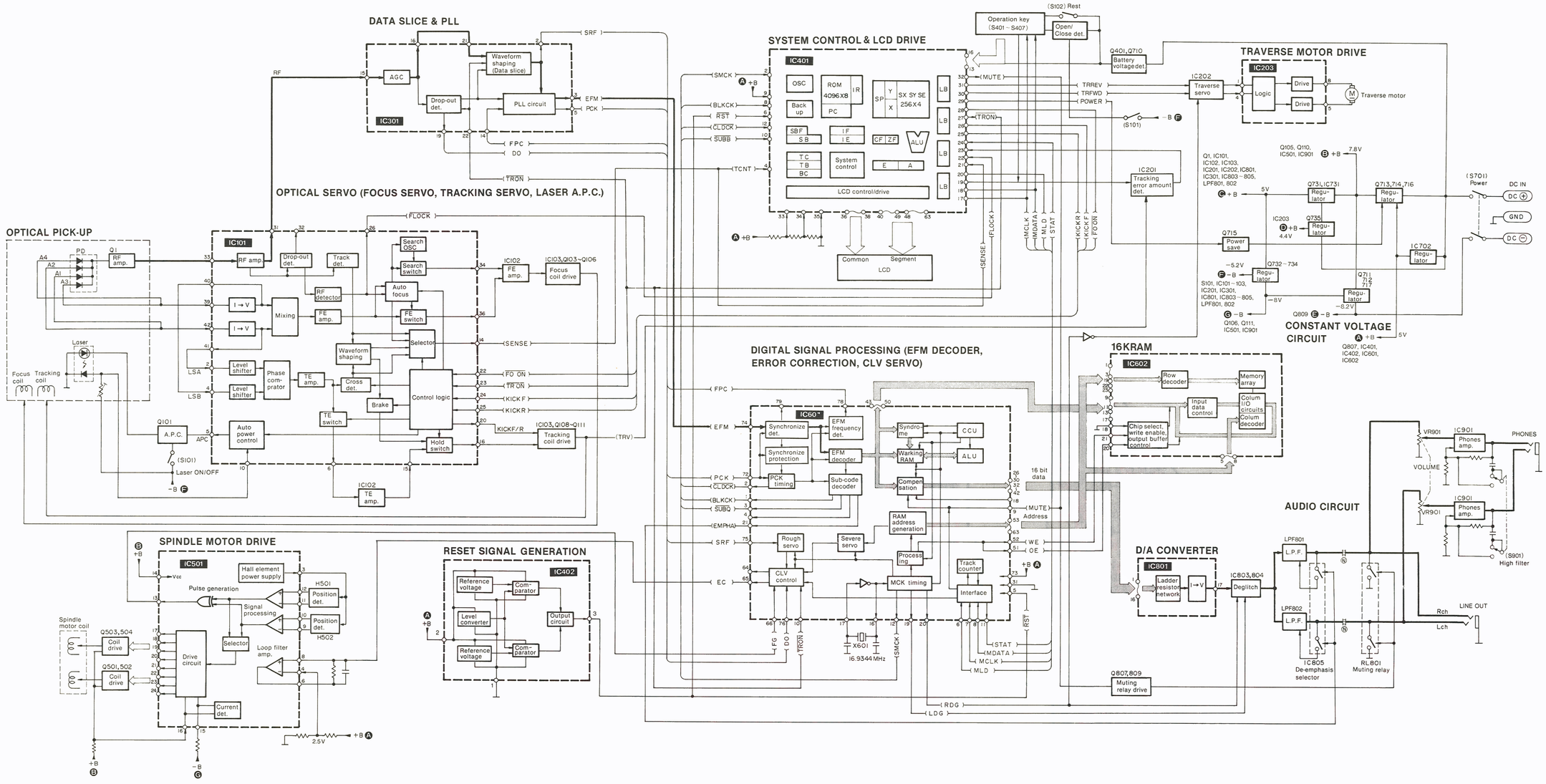
• CLV servo check



• Audio circuit check

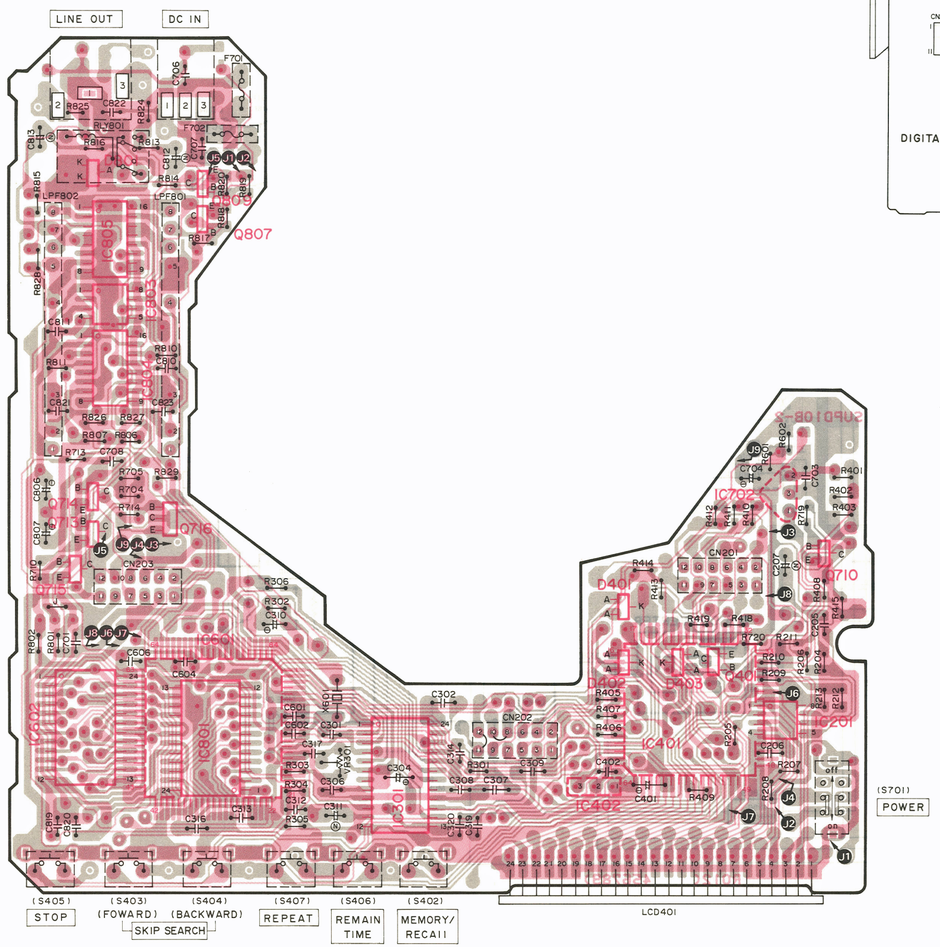


■ BLOCK DIAGRAM

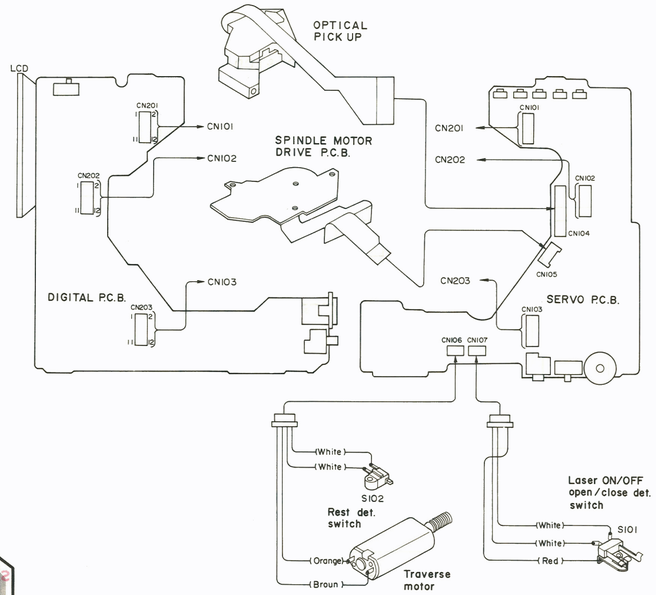


■ PRINTED CIRCUIT BOARD

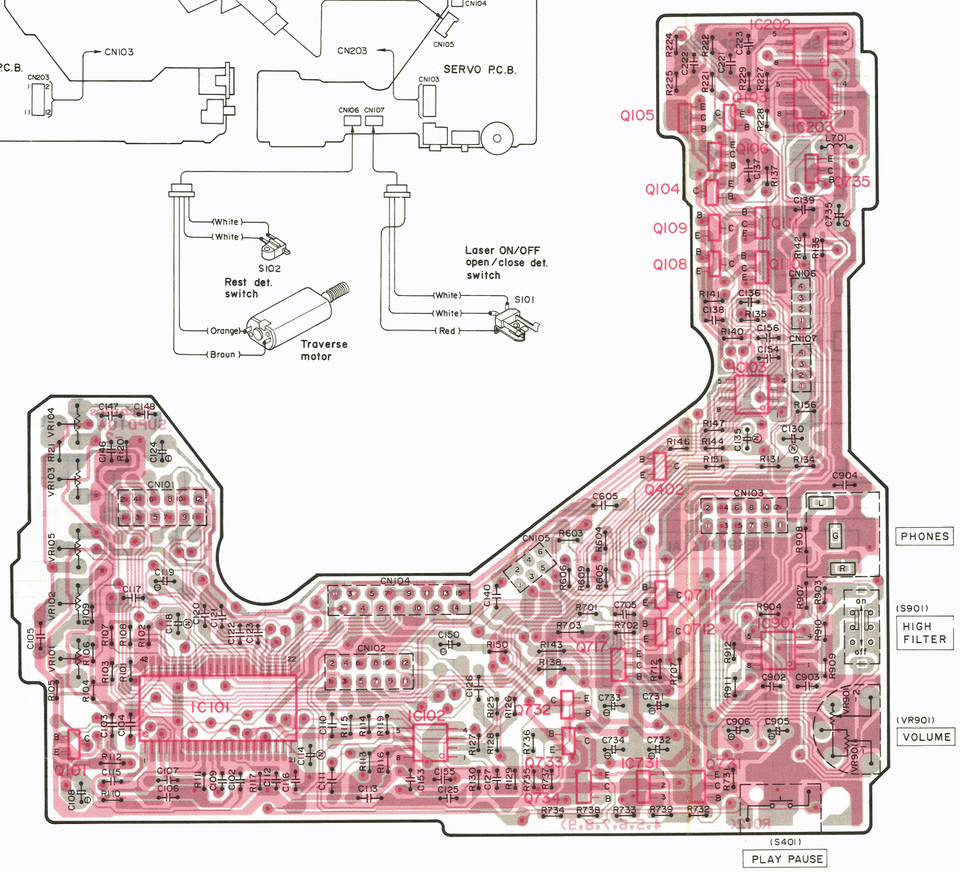
• Digital circuit



■ CONNECTION DIAGRAM



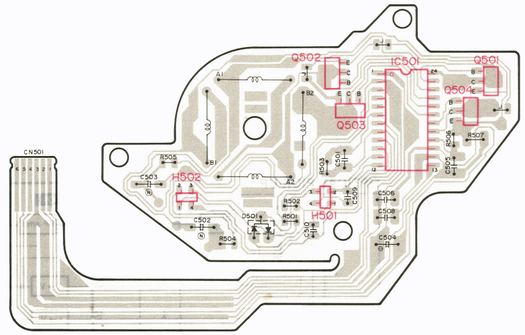
• Servo circuit



• Spindle motor drive circuit

Note: 1. The spindle motor drive circuit board is made by laminating iron sheet and FPC. It is very difficult to replace the parts on the circuit board. So, the repair parts are supplied in the from of finished P.C.B.

2. Do not cut the FPC fitted to the circuit board. (The finished P.C.B. must be otherwise replaced.)



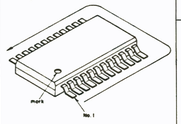
■ TERMINAL GUIDE OF IC'S, TRANSISTORS AND DIODES

SVINJM4560
SVIMB3763PF
AN6556S
AN1393S ..... 8 Pin

SVIUPD4053G ..... 16 Pin

SVIPCM55HP
MN4416S
AN8281S
AN8371S ..... 24 Pin

AN8370S ..... 42 Pin



AN8005

2SB709, 2SD601

Part name symbol hFE rank

1. Collector
2. Emitter
3. Base

Part name : A (2SB709)
symbol Y (2SD601)

2SB766, 2SB956
2SD874, 2SD1280

Part name symbol hFE rank

1. Base 2. Collector
3. Emitter

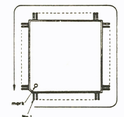
Part name : A (2SB766)
symbol Z (2SD874)
H (2SB956)
R (2SD1280)

MA153

MA151WK

MA151A

MN15845PDA ..... 64 Pin
MN6617 ..... 84 Pin

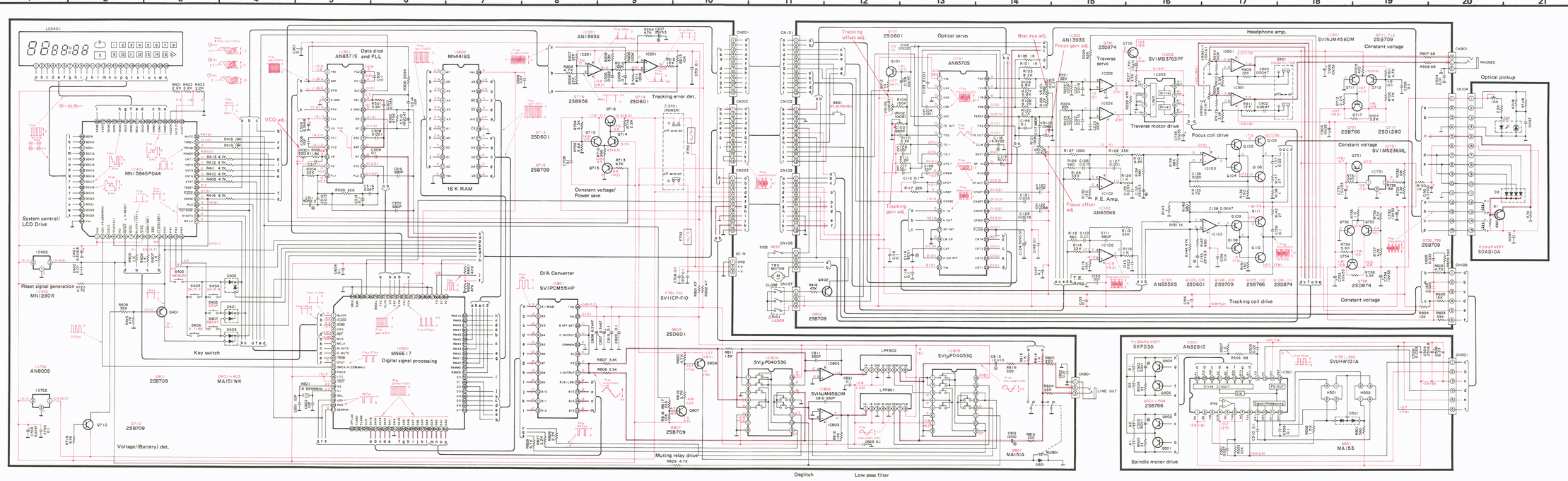


MN1280R

SVIM5236ML

■ SCHEMATIC DIAGRAM

(This schematic diagram may be modified at any time with the development of new technology.)



Notes:

1. **S101** : Laser ON/OFF switch in "**off**" position. (It turns "**on**" with disc holder closed.)
2. **S102** : Rest switch in "**off**" position. (It turns "**on**" when optical pickup comes to innermost periphery.)
3. **S401** : Play/pause switch.
4. **S402** : Memory/recall switch.
5. **S403** : Skip/search (Forward) switch.
6. **S404** : Skip/search (Backward) switch.
7. **S405** : Stop/clear switch.
8. **S406** : Remain time switch.
9. **S407** : Repeat switch.
10. **S701** : Power switch in "**on**" position.
11. **S901** : High filter switch in "**on**" position.
12. The voltage value and waveforms are the reference voltage of this unit measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of GND terminal (DC IN Jack).
    Accordingly, there may arise some error in the voltage values and waveforms depending upon the internal impedance of the tester or measuring unit.
    * The parenthesized is the voltage for test disc (1 kHz, L + R, 0 dB) in play mode, and the other, for no disc in stop mode.
    * AC adaptor (SH-CDA3U) is used for power supply.
13. ——— : Positive voltage lines and negative voltage lines.
    - - - : Audio signal lines
14. Important safety notice:
    Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

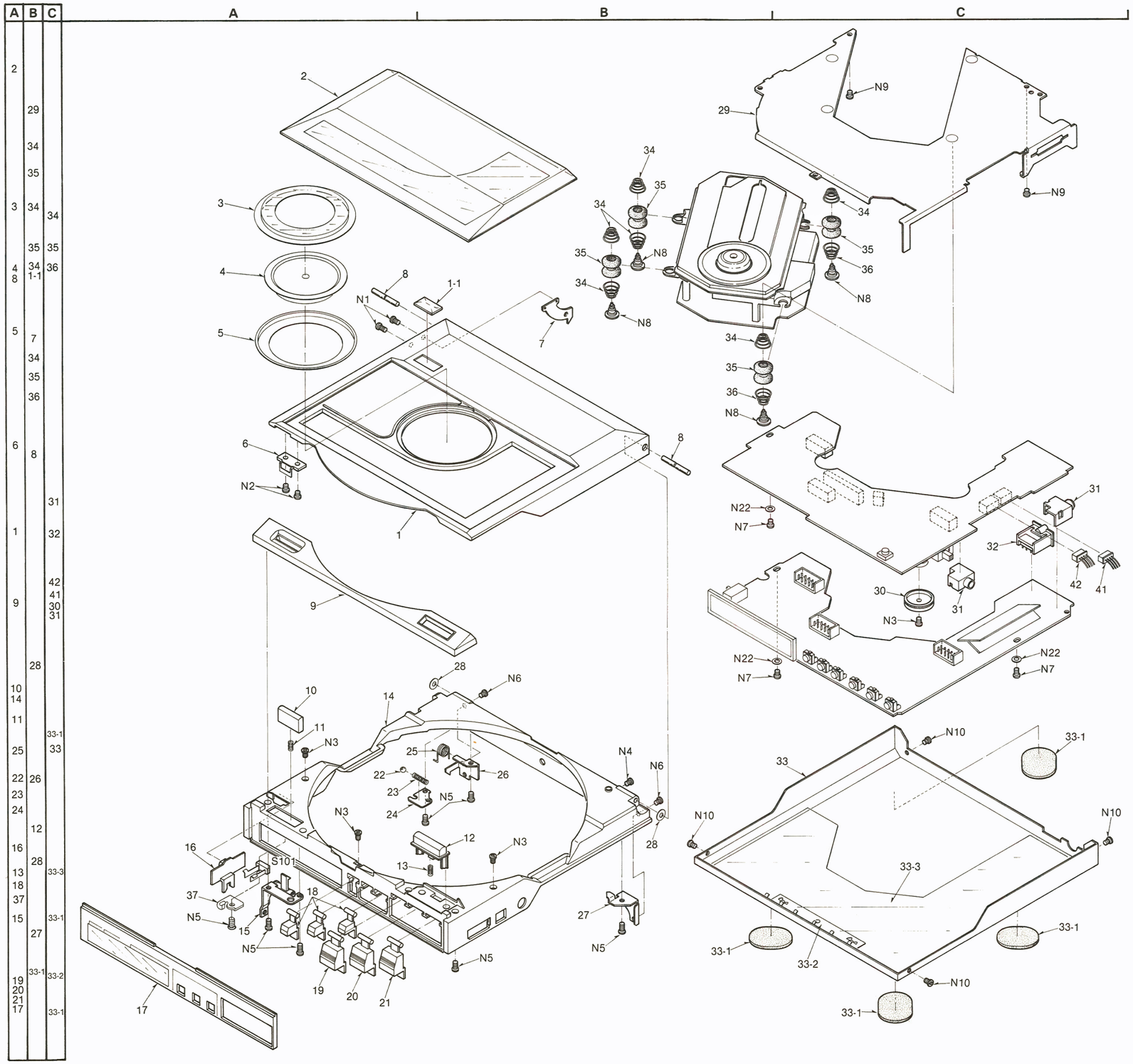
• Caution !

IC and LSI are sensitive to static electricity.
Secondary trouble can be prevented by taking care during repair.
* Cover the parts boxes made of plastics with aluminum foil.
* Ground the soldering iron.
* Put a conductive mat on the work table.
* Do not touch the legs of IC or LSI with the fingers directly.

SL-XP7

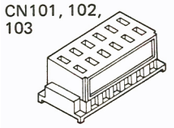
■ EXPLODED VIEWS

• Cabinet and chassis parts

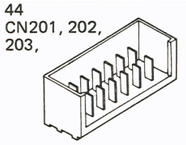


• Connectors

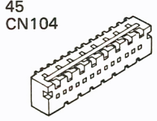
43
CN101, 102, 103



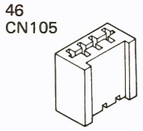
44
CN201, 202, 203,



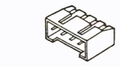
45
CN104



46
CN105

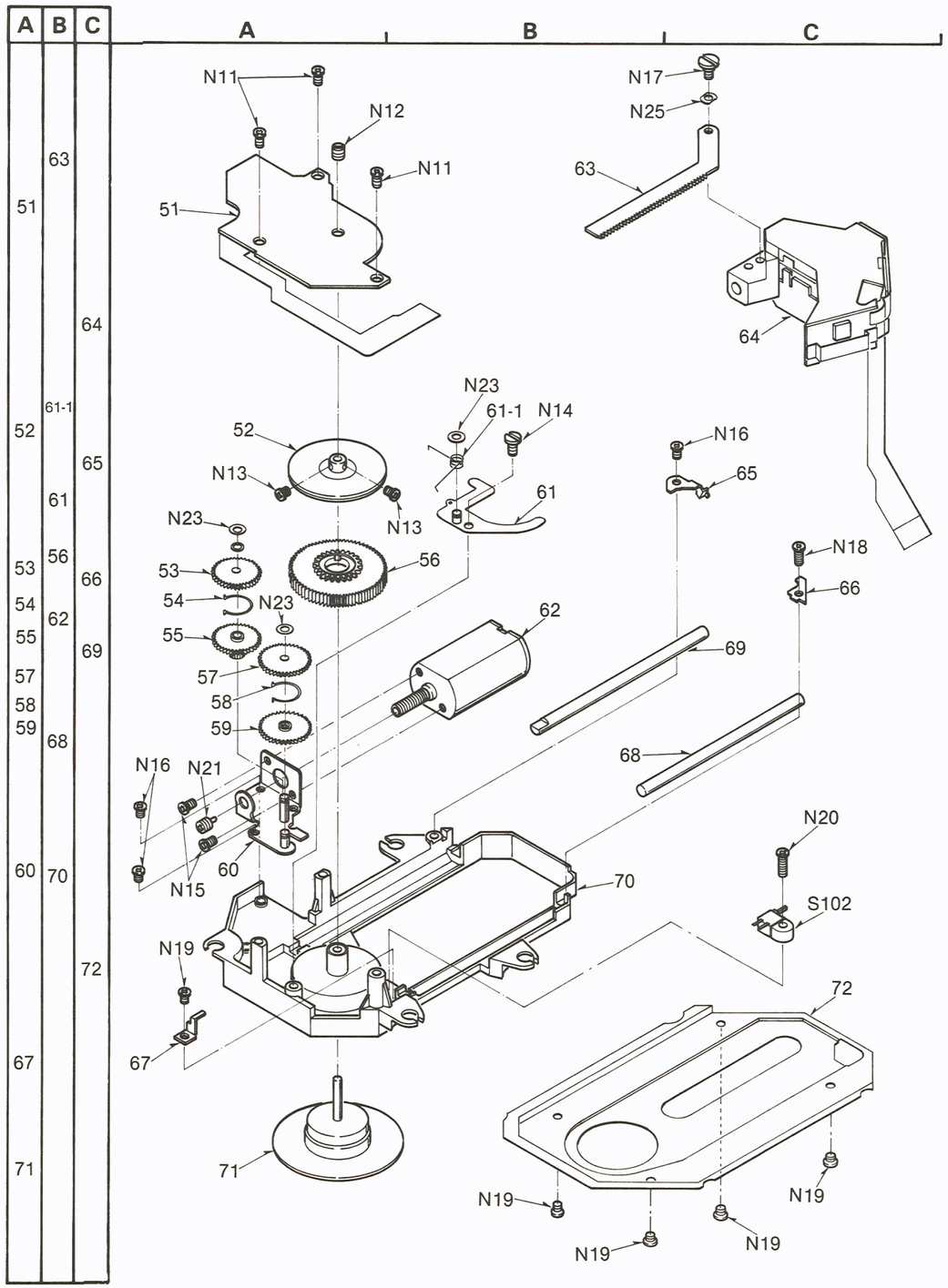


47
CN106 (White)
CN107 (Red)



SL-XP7

- **Traverse deck parts**



■ REPLACEMENT PARTS LIST

Notes:
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts order.
2. Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.
4. The " S " mark is service standard parts and may differ from production parts.
5. K -marked parts are used for black only, while ○-marked parts are for silver type only.
6. Part other than Ⓚ -and ○-marked are used for both black and silver types.
7. The parenthesized numbers in the columns of description stand for the quantity per set.

Color	Areas
(K) (S)	[E] ...Switzerland and Scandinavia.
(K) (S)	[EK] ...United Kingdom.
(K) (S)	[XL] ...Australia.
(K) (S)	[EG] ...F.R. Germany.
(K) (S)	[EB] ...Belgium.
(K) (S)	[EH] ...Holland.
(K) (S)	[EF] ...France.
(K) (S)	[Ei] ...Italy.
(K) (S)	[XA] ...Southeast Asia, Oceania, Africa, Middle Near East and Central South America.
(K) (S)	[XM]...Central South America.
(K) (S)	[PA] ...East PX.
(K) (S)	[PE] ...European Military.
(K) (S)	[PC] ...European Audio Club.

Ref. No.		Part No.	Description	
CABINET and CHASSIS PARTS				
1	○	SGDD2R−S	Top Cover Ass'y	(1)
1	Ⓚ	SGDD2R−K	Top Cover Ass'y	(1)
1-1		SGBD1	Badge	(1)
2	○	SGUD3	Top Panel	(1)
2	Ⓚ	SGUD3−1	Top Panel	(1)
3		SHRD2	Cover	(1)
4		SD0D5A	Disc Magnet	(1)
5		SD0D6	Holder	(1)
6		SSED3	Bracket	(1)
7		SBLD1−1	Stay	(1)
8		SUXD11	Shaft	(2)
9	○	SGXD4R−S	Front Panel	(1)
9	Ⓚ	SGXD4R−K	Front Panel	(1)
10		SBCD8	Button, Open	(1)
11		SUSD14	Spring	(1)
12		SBCD7	Button, Play	(1)
13		SUSD5	Spring	(1)
14		SKMD1−10A	Cabinet	(1)
15		SDGD8E	Lock Board Ass'y	(1)
16		SBDD1	Knob, Power	(1)
17		SGUD2−3	Display Panel	(1)
18		SBCD12	Button	(3)
19		SBCD11	Button, Skip (Left)	(1)
20		SBCD10	Button, Skip (Right)	(1)
21		SBCD9	Button, Stop	(1)
22		SNKD1−8	Ball	(1)
23		SUSD7	Spring	(1)
24		SUWD15	Bracket	(1)
25		SUSD4	Spring	(1)
26		SUWD9	Plate	(1)
27		SUWD8	Plate	(1)
28		SUDD5	Spacer	(2)
29		SUAD1E−2	Chassis	(1)
30		RBT207ZA−0	Knob, Volume	(1)
31		SJJD1	Jack (M3)	(2)
32		SJJD2	Jack, DC IN	(1)
33	○	SKUD3E1S	Bottom Cover Ass'y	(1)
33	Ⓚ	SKUD2E2K	Bottom Cover Ass'y	(1)
33-1		SHGD13	Foot	(4)
33-2		SUSD8	Spring	(1)
33-3		SMXD1	Sheet	(1)
34		S0SD6−1	Spring	(6)
35		SHGD1−1	Rubber Spacer	(4)
36		S0SD10−1	Spring	(2)
37		SMTD1	Terminal	(1)
38 [EK] only		SGTD37	Name Plate	(1)
38 [XA] only		SGTD38	Name Plate	(1)
41		SWKDXP7041	Connector Ass'y	(1)
42		SWKDXP7042	Connector Ass'y	(1)
43		EMCSK12S00A1	Connector	(3)
44		EMCSK12P00A1	Connector	(3)

Ref. No.		Part No.	Description	
CABINET and CHASSIS PARTS				
45		SJSD1501	Connector	(1)
46		SJSD1602	Connector	(1)
47		EMCS0450BL	Connector (White)	(1)
47		EMCS0450BLR	Connector (Red)	(1)
TRAVERSE DECK PARTS				
51		SXPD30	Spindle P.C.B. Ass'y	(1)
52		S0MD2A	Rotor Ass'y	(1)
53		SDGD3	Gear	(1)
54		SUSD1	Spring (A)	(1)
55		SDGD2−1	Gear (A)	(1)
56		SDGD6	Gear	(1)
57		SDGD5	Gear	(1)
58		SUSD2	Spring (B)	(1)
59		SDGD4	Gear (B)	(1)
60		SUWD4R	Bracket	(1)
61		SUWD5E	Bracket	(1)
61-1		SUSD3	Spring	(1)
62		SJGD1R	Motor Ass'y	(1)
63		SDGD7	Rack	(1)
64	⚠	S0AD10A	Optical Pick-up Ass'y	(1)
65		SUWD1	Plate (A)	(1)
66		SUWD2	Plate (B)	(1)
67		SUWD3	Plate (C)	(1)
68		SUXD1	Guide Shaft (A)	(1)
69		SUXD2	Guide Shaft (B)	(1)
70		SUND1E−1	Traverse Base	(1)
71		SD0D1E	Turntable Ass'y	(1)
72		SGXD13	Cover	(1)
SCREWS and WASHERS				
N1	○	XQN14+C35FN	Screw, M1.4×3.5	(2)
N1	Ⓚ	XQN14+C35FZ	Screw, M1.4×3.5	(2)
N2		XQN14+C25FZ	Screw, M1.4×2.5	(2)
N3		XQN17+C3FZ	Screw, M1.7×3	(4)
N4		XTN17+4GFZ	Screw, M1.7×4	(1)
N5		XTN17+4J	Screw, M1.7×4	(7)
N6		XQN14+C25FZ	Screw, M1.4×2.5	(2)
N7		XQN17+C3FYR	Screw, M1.7×3	(3)
N8		SNSD6−1	Screw	(4)
N9		XTN17+3JFYR	Screw, M1.7×3	(2)
N10	○	XQN14+C3FN	Screw, M1.4×3	(4)
N10	Ⓚ	XQN14+A3FZ	Screw, M1.4×3	(4)
N11		XQS17+A3	Screw	(3)
N12		SNSD3−1	Screw	(1)
N13		XQN14+A14	Screw, M1.4×1.4	(2)
N14		SNSD5	Screw	(1)
N15		XQS2+A25	Screw, M2×2.5	(2)
N16		XQN17+C3	Screw, M1.7×3	(3)
N17		SNSD4	Screw	(1)
N18		XQN17+A6	Screw, M1.7×6	(1)
N19		XQN17+A16FZ	Screw, M1.7×1.6	(5)
N20		XQN17+C5	Screw, M1.7×5	(1)
N21		SNSD2	Screw	(1)
N22		SUED1	Washer	(3)

Ref. No.	Part No.	Description	
SCREWS and WASHERS			
N23	SHWD1	Washer	(3)
N25	SNWD1	Washer	(1)
ACCESSORIES			
A1 [E, EB, EH]	SQUD3E	Instruction Book	(1)
A1 [EK]	SQUD4	Instruction Book	(1)
A1 [EI]	SQUD5	Instruction Book	(1)
A1 [PA, PE, PC]	SQUD7E	Instruction Book	(1)
A1 [Other]	SQUD6	Instruction Book	(1)
A2 [E] ⚠	SH−CDA3U−E	AC Adaptor	(1)
A2 [EK] ⚠	SH−CDA3U−EK	AC Adaptor	(1)
A2 [XL] ⚠	SH−CDA3U−XL	AC Adaptor	(1)
A2 [XA, XM, PA, PE, PC] ⚠	SH−CDA3U−X	AC Adaptor	(1)
A2 ⚠ [Other]	SH−CDA3U−EX	AC Adaptor	(1)
A3	SJPD5	Cord	(1)
A4 [XA, XM, PA, PE, PC] only ⚠	SFDKI19118	Plug	(1)
PACKING PARTS			
P1 [Other] ○	SPND17	Inner Carton Box	(1)
P1 [EF] ○	SPND18	Inner Carton Box	(1)
P1 [Other] Ⓚ	SPND19	Inner Carton Box	(1)
P1 [EF] Ⓚ	SPND20	Inner Carton Box	(1)
P2	SPSD1	Pad, Left	(1)
P3	SPSD2	Pad, Right	(1)
P4	SPPD1	Polyethylene Bag, Unit	(1)
P5 [Other] ○	SPGD10	Outer Carton Box	(1/5)
P5 [EF] ○	SPGD11	Outer Carton Box	(1/5)
P5 [Other] Ⓚ	SPGD12	Outer Carton Box	(1/5)
P5 [EF] Ⓚ	SPGD13	Outer Carton Box	(1/5)
P6	SPSD13	Pad, Outer Catron Box	(2/5)
P7 [Other]	SPSD21	Carton Box, AC Adaptor	(1)
P7 [XA, XM, PA, PE, PC]	SPSD23	Carton Box, AC Adaptor	(1)
P8 [Other]	SPSD22	Pad, AC Adaptor	(1)
P8 [XA, XM, PA, PE, PC]	SPSD25	Pad, AC Adaptor	(1)

Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC101	AN8370S	Integrated Circuit
IC102, 103	AN6556S	Integrated Circuit
IC201, 202	AN1393S	Integrated Circuit
IC203	SVIMB3763PF	Integrated Circuit
IC301	AN8371S	Integrated Circuit
IC401	MN15845PDA4	Integrated Circuit
IC402	MN1280−R	Integrated Circuit
IC501	AN8281S	Integrated Circuit
IC601	MN6617	Integrated Circuit
IC602	MN4416S−12	Integrated Circuit
IC702	AN8005	Integrated Circuit
IC731	SVIM5236ML	Integrated Circuit
IC801	SVIPCM55HP	Integrated Circuit
IC803, 901	SVINJM4560M	Integrated Circuit
IC804, 805	SVIUPD4053G	Integrated Circuit
TRANSISTORS		
Q101, 103	2SD601A	Transistor
Q104	2SB709A	Transistor
Q105	2SB766QTX	Transistor
Q106	2SD874QTX	Transistor

Ref. No.	Part No.	Description
TRANSISTORS		
Q108	2SD601A	Transistor
Q109	2SB709A	Transistor
Q110	2SB766QTX	Transistor
Q111	2SD874QTX	Transistor
Q401, 402	2SB709A	Transistor
Q501～504	2SB766QTX	Transistor
Q710	2SB709A	Transistor
Q711, 712	2SB709A	Transistor
Q713, 714	2SD601A	Transistor
Q715	2SB709A	Transistor
Q716	2SB956RTX	Transistor
Q717	2SD1280QTX	Transistor
Q731	2SB766QTX	Transistor
Q732, 733	2SB709A	Transistor
Q734, 735	2SD874QTX	Transistor
Q807	2SB709A	Transistor
Q809	2SD601A	Transistor
DIODES		
D401～403	MA151WK	Diode
D501	MA153	Diode
D801	MA151A	Diode
CRYSTAL		
X601	SVQAT1693	Crystal, 16.9344MHz
FILTERS		
LPF801	EHF5L1B20001	Low Pass Filter
LPF802	SVIAL041B	Low Pass Filter
HALL ELEMENTS		
H501, 502	SVUHW101A	Hall Element

Ref. No.	Part No.	Description
VARIABLE RESISTORS		
VR101	EVND1AA00B53	Variable Resistor, 5kΩ (B)
VR102～105	EVND1AA00B14	Variable Resistor, 10kΩ (B)
VR301	EVML4GA00B52	Variable Resistor, 500kΩ (B)
VR901	EVUBQAT50A14	Volume, 10kΩ (A)
SWITCHES		
S101	⚠ SSED4	Laser ON/OFF
S102	SSHD1	Rest
S401	EVQQV105T	Play
S402～407	EVQQSN04T	Operation
S701	⚠ SSSD1	Power
S901	SSSD2	High Filter
RELAY		
RLY801	SSYD2	Muting
LIQUID CRYSTAL DISPLAY		
LCD401	EDD062C51A3P	Display
COIL		
L701	SLQDE45S100K	Choke
IC PROTECTOR		
F701, 702	SVIICP−F10	IC Protector

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ORDER NO. HAD860132S0

Service Manual

Supplement

COMPACT disc DIGITAL AUDIO

DIGITAL

Portable CD Player

Compact Disc Player

SL-XP7

Color

(K)...Black Type
(S)...Silver Type

Adjustment Manual

Areas

[MC] ... Canada
[E] ..... Switzerland and Scandinavia
[EK] .... United Kingdom
[XL] .... Australia
[EG] ... F.R. Germany
[EB] .... Belgium
[EH] .... Holland
[EF] .... France
[Ei] ..... Italy
[EC] .... Czechoslovakia
[XA] .... Southeast Asia, Oceania, Africa, Middle Near East and Central South America
[XM] ... Central South America
[PA] .... Far East PX
[PE] .... European Military
[PC] .... European Audio Club

Please use this manual together with the service manual for Model No. SL-XP7, Order No. HAD8509260G0. HAD8510283C9.

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